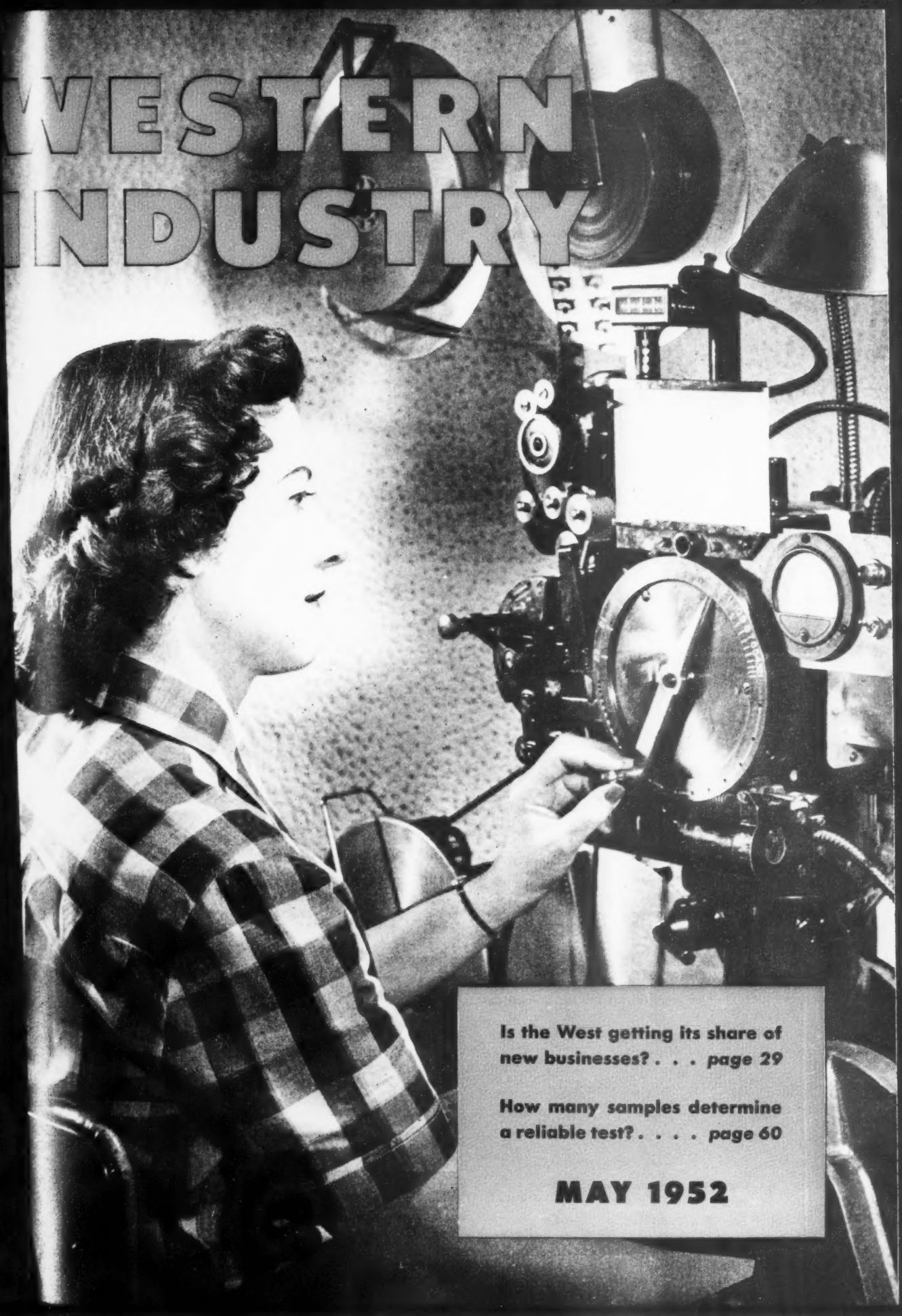
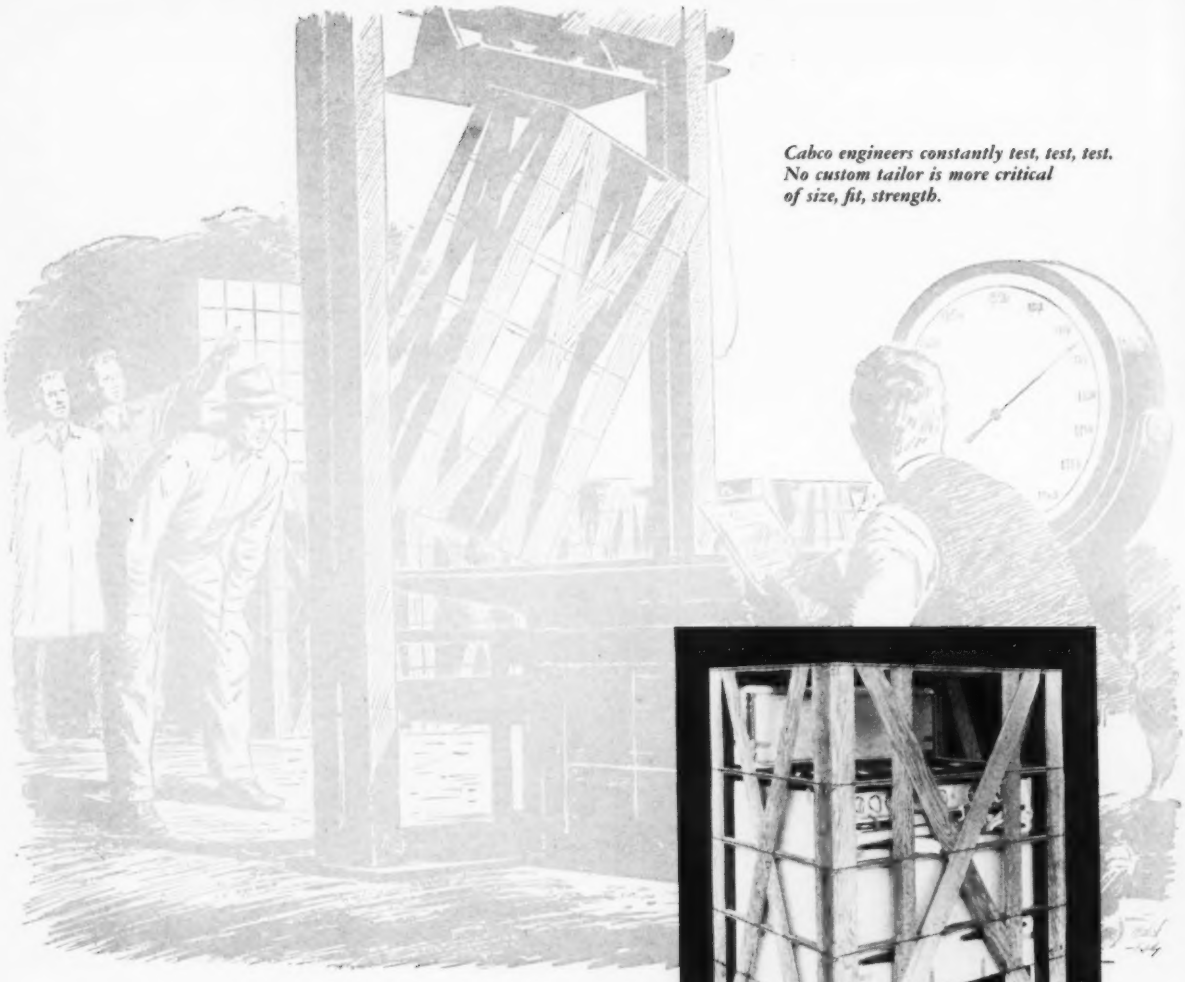
WESTERN INDUSTRY



Is the West getting its share of new businesses? . . . page 29

How many samples determine a reliable test? . . . . page 60

MAY 1952



Cabco engineers constantly test, test, test. No custom tailor is more critical of size, fit, strength.

You get more from CABCO

...the West's foremost designer and manufacturer of wooden shipping containers

The unseen extra ingredient in a Cabco container is the skilled engineering that goes into its manufacture. Every day, you'll find Cabco engineers in the fields, factories and shipping docks, getting first-hand information on what users want a shipping container to do. Every part of a Cabco wirebound is painstakingly engineered for better fit, better closing, easy handling, snug carloading, utmost protection. You can always count on Cabco to give you *more!*

STOVES, TOO, MOVE IN CABCO quality-built wirebound containers. Special Cabco open-type design wraps quickly, easily around new ranges, speeds packing, makes for easy handling. "Flex" feature of Cabco wirebounds absorbs travel shocks, helps prevent damage. Open design permits ready identification of contents. Users save both on container cost and on freight.

CABCO

A product of the California Barrel Company, Ltd.

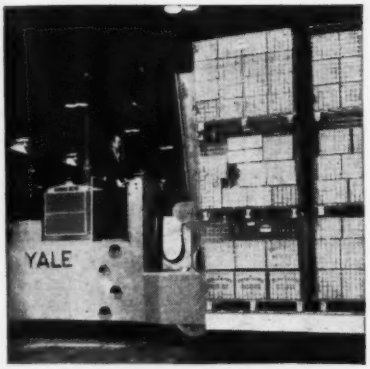
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Title_____

Company_____

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WESTERN INDUSTRY

VOLUME XVII MAY • 1952 NUMBER 5

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FRONT COVER

Hollywood and its environs are generally looked upon as the principal habitat of motion picture studios, but in Colorado Springs is to be found the only complete commercial picture production plant in America. Picture shows an operator at Alexander Film Co. using a laboratory film printer by which multiple prints are made from a master negative.

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AUDIENCE TESTED PRODUCTIONS
can predict, before release,
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AUDIENCE REACTOGRAPH CHART

LIKES

DISLIKES

ZOLOTOW



IDEAL CEMENT CO. uses G-E Pacific Gear-motors throughout packing plant. Above, G-E Gear-motor drives a truck loader.

Three More Plants Choose G-E Pacific Gear-motors

ONE PLANT REPORTS SPACE SAVINGS, OTHERS LOW MAINTENANCE, RELIABILITY

A large cement company, a lumber mill, and a prominent sugar refinery have been added to the growing list of Western industries profitably using General Electric Pacific Gear-motors for low-speed drives.

For example, every operation in the packing plant of the Ideal Cement Company, Devils Slide, Utah, has been recently motorized with G-E Pacific Gear-motors. The plant reports savings in floor space and initial cost over any chain drive and separate speed reducer investigated. Similar reports from other industries point to savings in maintenance costs, and years of reliable operation.

Prompt Delivery is assured from warehouse stocks in eight key Western areas. And because G-E Pacific Gear-motors are manufactured on the West Coast, factory shipment is fast and dependable. General Electric Co., Schenectady 5, N. Y.

756-1



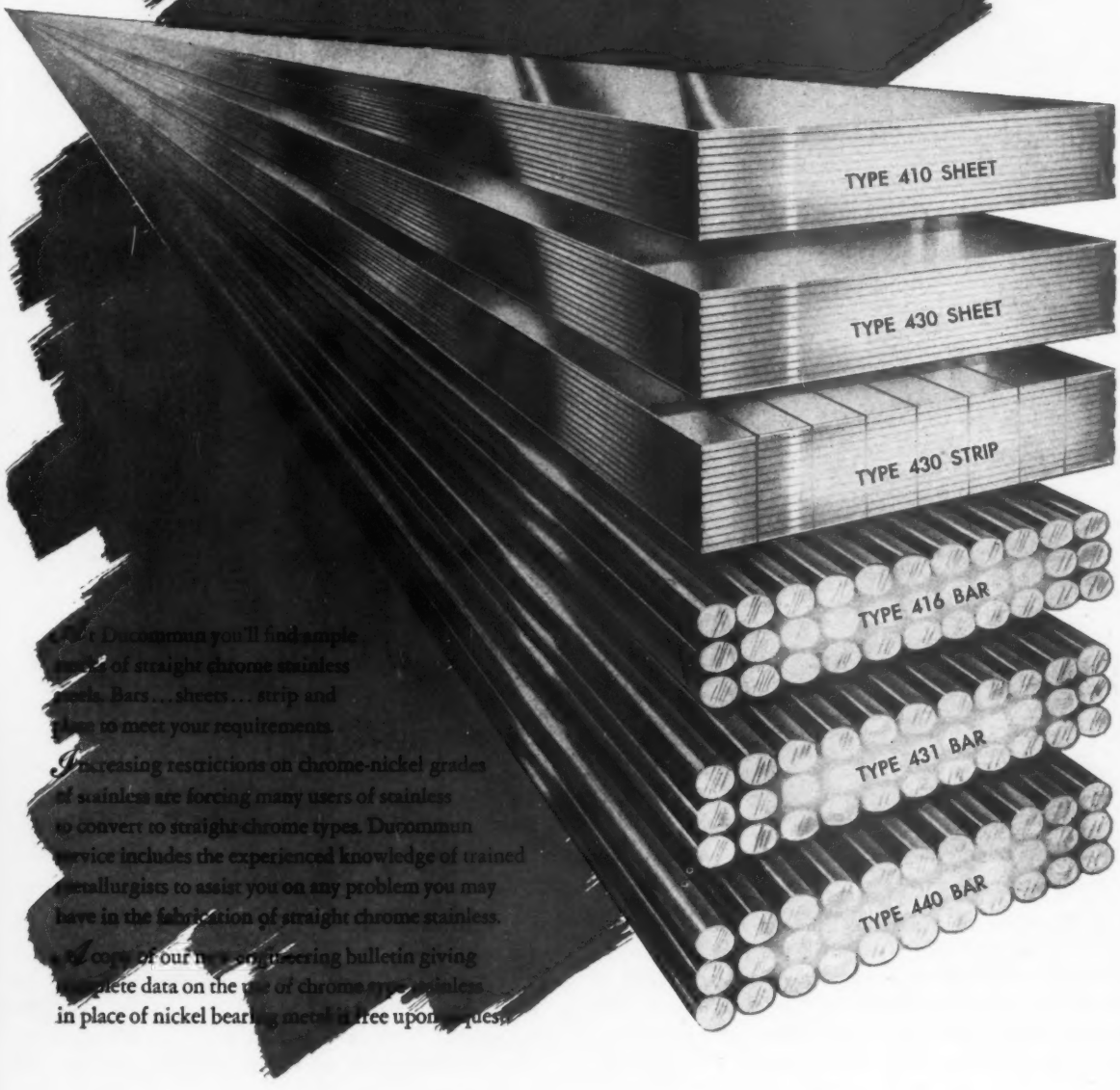
WEST COAST LUMBER INDUSTRY likes G-E Pacific Gear-motors for heavy work. Above, G-E Gear-motors drive debarker.



AMERICAN CRYSTAL SUGAR CO. wanted modern drive, picked G-E Gear-motors to power rotary filters in beet sugar plant.

GENERAL ELECTRIC

Here's The Stainless You Need!



At Ducommun you'll find ample stocks of straight chrome stainless steels. Bars... sheets... strip and plate to meet your requirements.

Increasing restrictions on chrome-nickel grades of stainless are forcing many users of stainless to convert to straight chrome types. Ducommun service includes the experienced knowledge of trained metallurgists to assist you on any problem you may have in the fabrication of straight chrome stainless.

A copy of our new engineering bulletin giving complete data on the use of chrome type stainless in place of nickel bearing metal is free upon request.

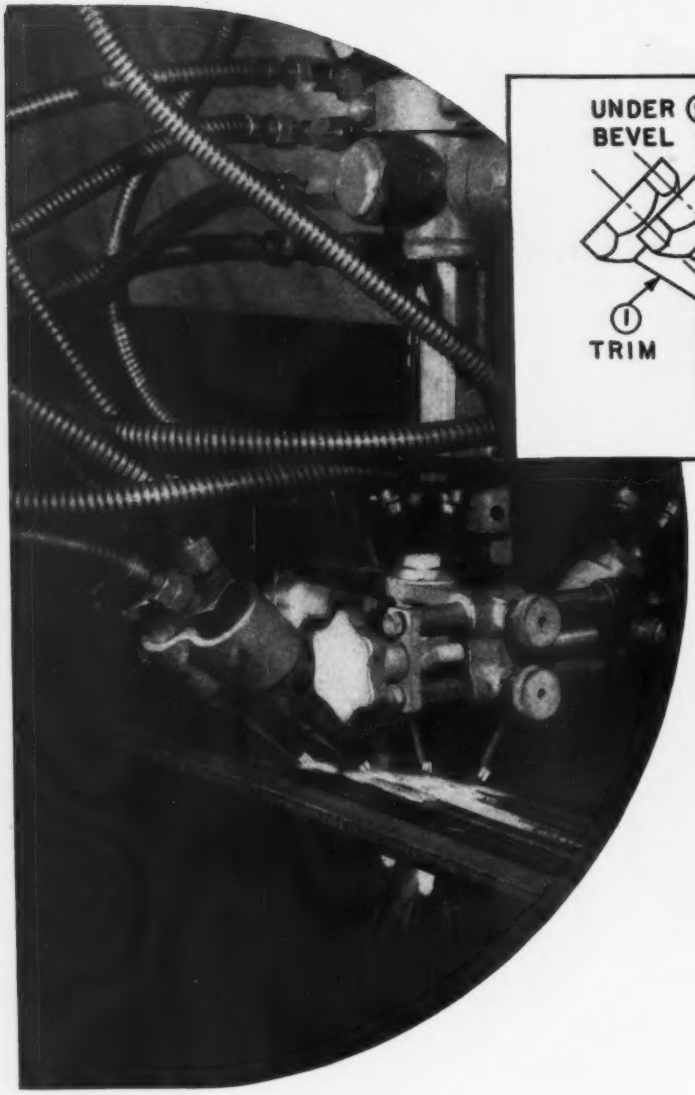


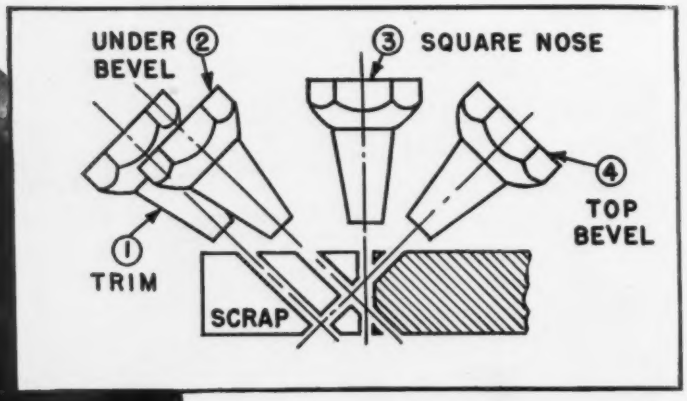
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Swift-moving oxy-acetylene flames prepare steel plate edges for welding in a fraction of the time required by mechanical methods. Multiple nozzles, cutting in different planes simultaneously, slash with ease through any commercial thickness. *Just one pass to "finish" dimensions* turns out a square edge, single bevel, single bevel and nose, double bevel, double bevel and nose, or J-groove and nose. Edge preparation costs tumble; production booms.

LINDE'S oxygen-cutting methods are simple and flexible. They are economical and easy to use. They cut plates so smoothly and accurately that *no machining is necessary*—edges are ready to weld "as cut". Rigid fit-up and contour specifications are easily met. Yet, initial investment in OXWELD flame-cutting equipment is only a fraction of that for comparable machine tools. Upkeep over the years is extremely low.

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For further details, telephone or write today. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 E. 42nd St., New York 17, N. Y. Offices in Other Principal Cities. In Canada: Dominion Oxygen Company, Limited, Toronto.

The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

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Products and Processes for MAKING, CUTTING, JOINING, TREATING, AND FORMING METALS



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Pearson Truck Co., Los Angeles, Cal.

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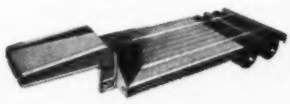
Fruehauf Machinery Trailers are precision-built to take heavy hauls right in stride. No matter what your hauling problem, you'll find Fruehaufs engineered with all the features needed to do *big jobs:* deep structural outside rails, rugged vertical supports, thick fir floors for easy load blocking, and unusually large level loading area, to name but a few.

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Be sure to include your *industrial distributor* in your procurement program. He, too, is organized for defense—his country's, and yours!

How can *you* make better use of your distributor in a period of scarcities? Two ways:

First, make a practice of buying through your distributor those products most suitable to *his* type of distribution. He can carry part of your inventory for you, delivering from his nearby warehouse in accordance with your needs. He can "lump" shipments otherwise requiring transportation from a number of distant points. He can save you purchasing time and cut your paper work to a fraction.

Second, keep him *informed* of what products you regularly need—particularly of those you have difficulty getting. His contacts may prove valuable to you . . . he can often suggest satisfactory substitutes for hard-to-get items. He is just as eager to ship you scarce items as you are to get them—he will do his utmost to keep you supplied if you'll tell him what you want.

Remember—your distributor is on *your* team. Let him carry the ball!

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

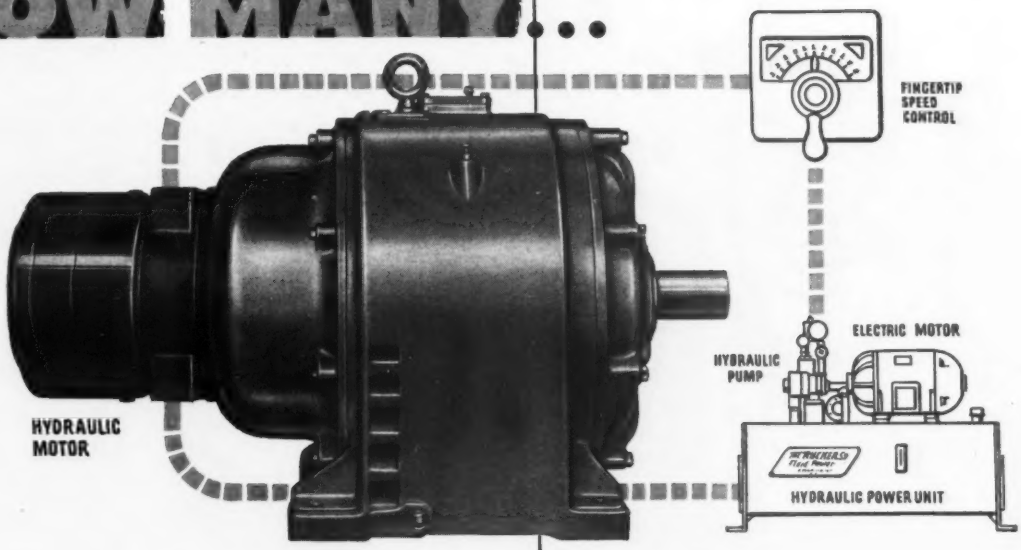
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HYDRAULIC-POWERED
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For help on your power transmission problems, phone, wire or write our nearest office TODAY. Our field men are all experienced mechanical or chemical engineers, qualified to understand and discuss your needs. Consult them NOW. No obligation.

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STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Cutting Oil 20-TA

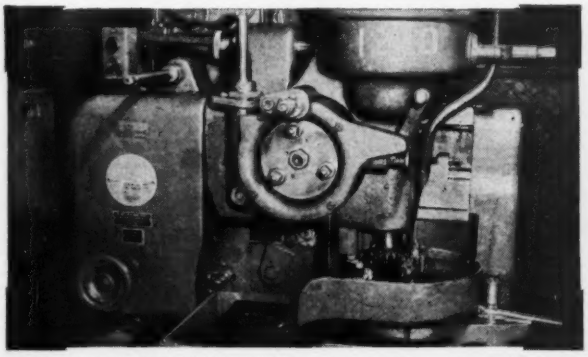
TOOL High-speed gear shaper + others

LUBRICATOR Circulating and hand

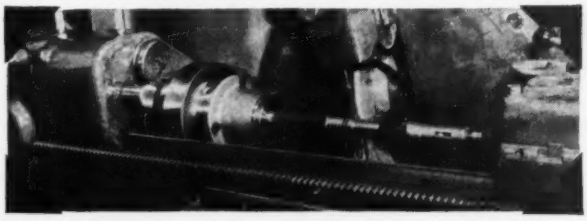
SERVICE Making fuel-burner and engine parts

FIRM Iron Fireman Mfg. Co., Portland, Oregon

Calol cutting oil triples machine-tool life!



THIS HIGH-SPEED GEAR SHAPER, in the big Iron Fireman Manufacturing Co. shop at Portland, Oregon, required a new cutting tool every half day until Calol Cutting Oil 20-TA replaced the comparable type competitive lubricant being used. Now tools on the machine are only changed after 1½ days of use. "Besides three times longer tool life, I get good surface finish at high speeds with Calol Cutting Oil, and it costs me far less than the oil I was using," says Bill Huntley, Maintenance Foreman.

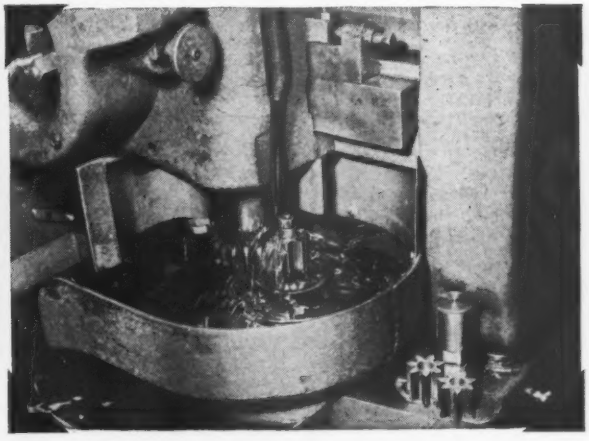


CALOL CUTTING OILS are used in all the many machining operations in Iron Fireman's shop. This includes thread grinding (shown here), shaping, hobbing, drilling, turning and broaching. There is a complete line of Calol Cutting and Soluble Oils to meet every machining condition. They come in four general types: Mineral oils, ready-mixed compounded oils, concentrates and soluble oils.



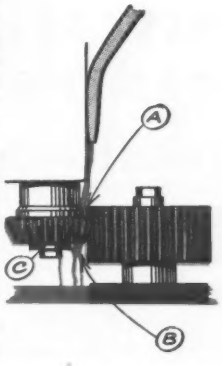
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How to increase efficiency in all metal-cutting operations

Use the correct Calol Cutting Fluid for any operation from grinding to broaching. Recommendations for each are made from actual working results.



A. Have high cooling and lubricating qualities—minimize "built-up edge" and promote good finish.

B. Flush away cuttings readily.

C. Protect machine and work against rusting and corrosion.

STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

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HARNISCHFEGER CORPORATION

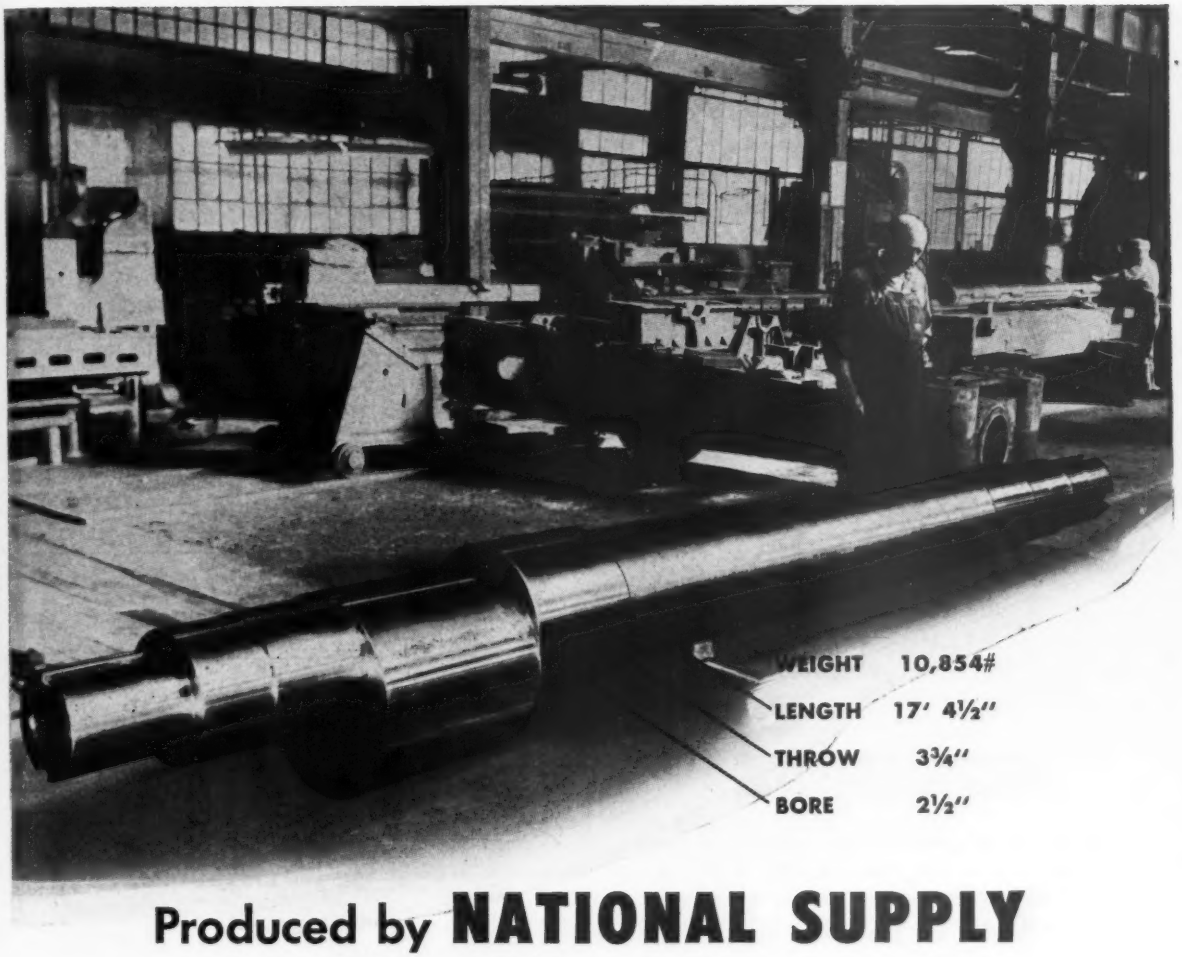
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ALLOY STEEL ECCENTRIC SHAFT
for Bar Mill Shear



Produced by NATIONAL SUPPLY

Eccentric shafts, slag pot stands, hopper feed changing valve seats, and dozens of other cast, forged, and welded products for the iron and steel industry are manufactured at National Supply. Although the product list has always been extensive, the steel industry is only one of many served by the Industrial Products Division.

Just a partial review of the others would show the names of manufacturers of pumps, mining machinery, aircraft, cement kilns, presses, ordnance materiel, and a rapidly expanding group of other types of industries.

The facilities of the Industrial Products Division are so extensive, its workers' skills so varied, that National Supply is a logical source for cast, forged, welded and precision-machined parts and assemblies, with a conveniently located plant accessible to all western industries. These services are worthy of your investigation.

INDUSTRIAL PRODUCTS DIVISION

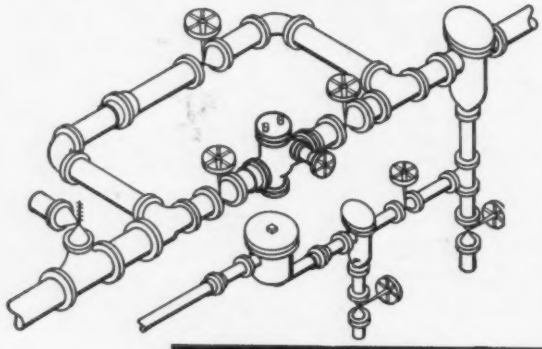
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TORRANCE, CALIFORNIA • LOS ANGELES AREA

IDEAL PRESSED STEEL FORGINGS • BILLETS AND LARGE BARS • STEEL CASTINGS AND SPECIAL MACHINERY
MELTING • FORGING • CASTING • MACHINING • HEAT TREATING • ASSEMBLING • WELDING • TESTING

Can Your Pressure Regulators Match This Service Record?

...on a Steam Kettle for instance



THE INSTALLATION

On steam supply line to cooking kettle, Schoenling Brewing Company, Cincinnati.

VALVE SERVICE RATINGS

SERVICE LIFE:	16 years - 24 hours per day
MAINTENANCE COST:	None - simple servicing only
SPECIAL FEATURES:	Good pressure range - easy adjustment
SUITABILITY:	Steady flow - no pressure build-up
OPERATING RESULTS:	Accurate control of cooking process
PRICE:	Low - considering service life
AVAILABILITY:	Stock item - Crane line

THE HISTORY

Specifications for this installation called for a regulator to reduce main line steam supply at 100 psi to 30 psi, and automatically maintain the reduced pressure to cooker, 24 hours daily, without significant fluctuation.

A Crane Pressure Regulator with factory pre-set range was selected and properly installed with adequate, automatic drainage of the steam lines.

For 16 years, throughout its lifetime, the Crane Pressure Regulator did its job to the brewery's complete satisfaction. Never was it out of service; never did it require more than the simple prescribed periodic inspection. (Note: current model has renewable wearing parts; will virtually never wear out.)

THE VALVE

Crane No. 960 Brass Pressure Regulators are made for reducing steam or air pressures up to 250 pounds, to within 80% of inlet pressure. They are factory pre-set to operate within any of 4 ranges from 1 to 200 pounds, with easily selected outlet pressure within set range. Precision made, they are fully automatic, highly dependable, even under reasonable fluctuation of inlet pressure. All wearing parts renewable. See your Crane Catalog or Crane Representative for complete data.



The Complete Crane Line Meets All Valve Needs. That's Why

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THE COMPLETELY NEW LEWIS-SHEPARD JACKSTACKER® TRUCK



Here's the most compact truck of its kind, only 26½"* long. It easily right angle stacks in 5'6" aisles. Its new, compound wound, traction motor packs twice the power in 48% less space.

Here's the answer to your cramped area handling. In receiving, production, storage and shipping, — wherever you move and stack, — it multiplies your manpower and your space.

It's the Quality Truck in the Walkie Field, — with 89 engineering advancements; Capacities up to 6,000 lbs.; Open face pallet, straddle, platform and counterbalance types.
**Plus load length.*

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Company_____

Street_____

City_____ State_____



ADDING NEW STRENGTH TO THE WEST

Kaiser Steel's third blast furnace to increase Pacific Coast's production of new metal 50%

THE urgent need of more steel is as clear as the front page of your newspaper. And the production of new steel must start at the heart of a steel mill—its blast furnaces, which make pig iron for conversion into steel.

To help meet this need, Kaiser Steel—now operating the only two blast furnaces on the Pacific Coast—has started construction of a third. Scheduled for completion in the spring of 1953, this blast furnace will increase Kaiser Steel's pig iron output by 50 per cent—438,000 additional tons a year.

Kaiser Steel's expansion program, entirely privately financed, also includes:

. . . a ninth open hearth furnace to increase production of steel ingots

. . . ninety new by-product coke ovens to supply coke to the blast furnaces

. . . two new roll stands in the present hot strip mill, to enable it to roll sheet of lighter gauges and greater widths.

Naturally, this expansion means more prosperity for the West, through additional jobs and increased purchases of materials.

More important, it means that manufacturers here will be less dependent on steel produced in other areas . . . bringing the West another step forward in its advance to industrial self-sufficiency.

It's good business to do business with

Kaiser Steel

built to serve the West

KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, NEW YORK

GROUND-LEVEL EFFICIENCY



FROM 3 TO 24 FEET

Adjustable, portable work platform . . .
holds the man up to the job — safely

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★ SAVES MAN-HOURS ★ INCREASES EFFICIENCY
★ CUTS ACCIDENTS

widely used in:

Steel plants
Oil refineries
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FREE CONSULTATION SERVICE:

Weber Aerostand can save money and increase efficiency in your plant. A Weber engineer will make a complete analysis of your "above-ground-level" work and recommend the Aerostands required to do the job. Return the coupon or write on your letterhead.

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☐ We would like your engineer to consult with us on the possible use of AEROSTAND in our plant
☐ Would like additional information

COMPANY NAME_____
TYPE OF BUSINESS_____
CONTACT MR._____
ADDRESS_____
CITY_____ ZONE____ STATE_____



It's been a busy day!

Gosh . . . I've been going since early morn but the results were worth it. First, there was that furniture house. We figured how they could save money by routing a different way. Then—a building materials firm where we discussed their present lease and a possible new location. Following that came a call from a paper company who wanted help on getting an industry track built. Then a floor covering concern that had a packing and loading problem. Our container engineers are helping out on that.

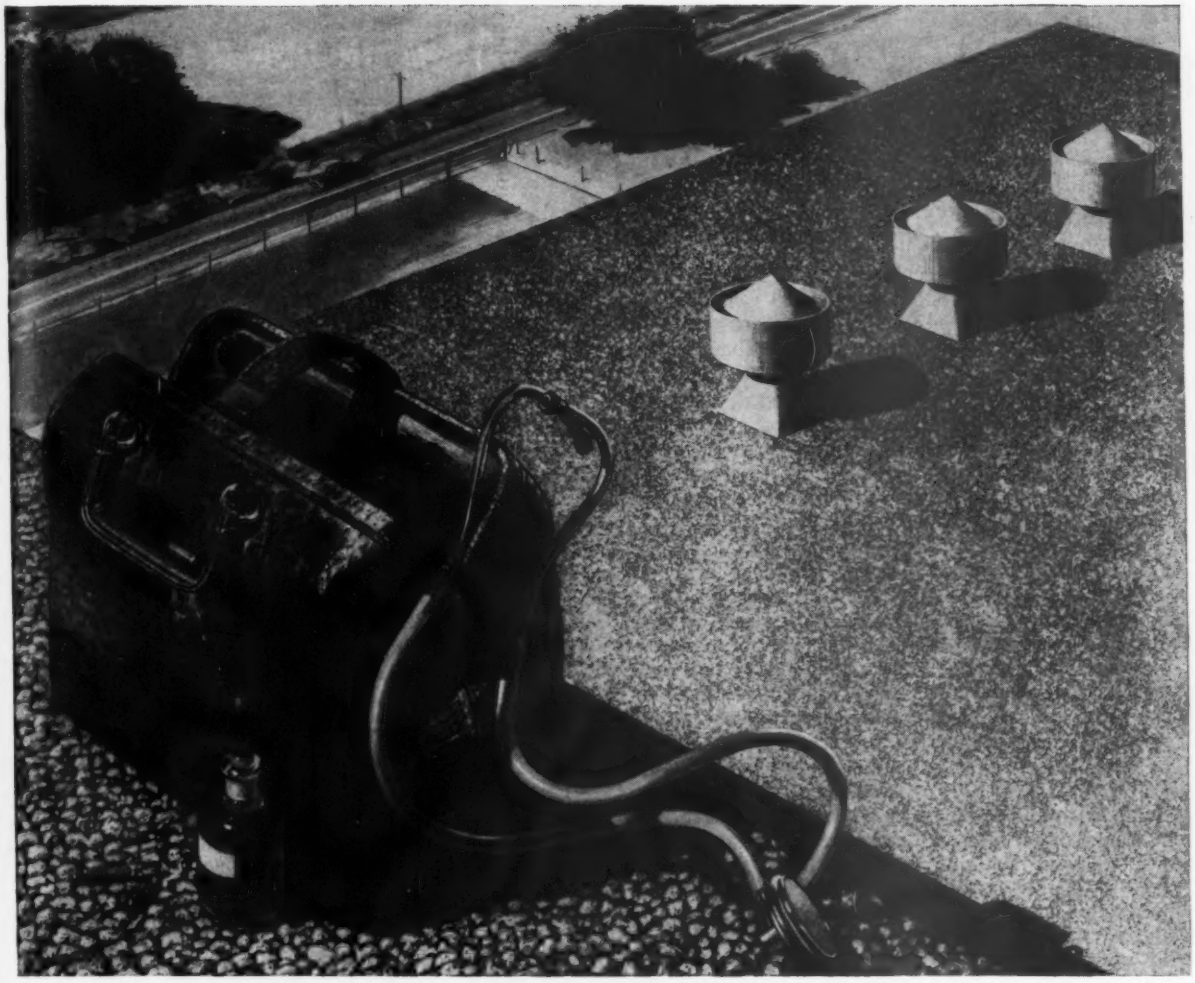
Let's see—what else? Oh, yes, that new manufacturing firm that needed a line of rates for moving its products to consuming areas. Also a woolen mill in connection with L.C.L. service, and so on.

• • • •

That gives you an idea as to how the varied experience of our freight representatives can be helpful to you. Call on your nearest U. P. freight man at any time. He's there to assist and advise you.

Be Specific – Ship "Union Pacific"

(Offices in 70 cities throughout the U. S. A.)



Roof that "doctors" itself!

● Cracks from weathering have a nasty habit of cropping up on roofs. If these cracks are overlooked or neglected, they grow bigger — deeper — and the roof is headed for expensive repairs.

But there's no such worry with a Koppers Pitch and Felt Roof. When a crack appears on the roofing surface, it's not long before the pitch starts to flow into the fissure . . . "doctors" the injured area by gradually filling it up and sealing it.

Besides being self-healing, Koppers Roofs have many other properties that result in long-life roofing. Take water-resistance, for example. Many Koppers Roofs are water-cooled; even though water completely covers these roofs, they still protect buildings and their contents effectively.

Koppers has confidence in its roofs —best proved by this fact: we will actually *guarantee* the performance of our roofing materials for as long as twenty years, provided, of course, they are applied by an Approved Roofer according to our specifications.

Koppers makes flat roofs for industrial *and* residential buildings. Specify Koppers, and you'll have the best in built-up roofing. Full information and specifications on request. Koppers Company, Inc., Tar Products Division, Los Angeles 1, California.

KOPPERS

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

Western District Office: 727 East Gage Ave., Los Angeles 1, California

OTHER DISTRICT OFFICES: BOSTON, CHICAGO, NEW YORK, PITTSBURGH, AND WOODWARD, ALABAMA

• SPECIFY KOPPERS FOR LONG-LIFE ROOFING •

EDITORIAL COMMENT

Seeking the Unifying Link

ELSEWHERE in this issue will be found a report of the meeting held in Seattle April 2 to consider the formation of a Pacific Coast Industrial Council, for the purpose of exchanging information on matters of common interest and encouraging cooperation on common causes wherever possible.

There is no occasion for either elation or regrets over this meeting. It was neither a success nor a failure. It did not weld together a group that will meet periodically and serve both as a clearing house and a rallying point; nor on the other hand did it throw up any barriers against the gradual development of such an organization.

It did reveal clearly that the West's common interests are not clearly defined, and that there is need for much exploratory work to bring them into sharp focus. As we see the situation, it would be well for all concerned to spend less time dwelling on the possible points of difference and more on the possible opportunities for mutual benefit which may be revealed. Granted that there were one or more ill-timed and ill-advised speeches at Seattle, they were beside the point and can safely be ignored.

All of the intra-regional organizations in the West are performing useful services, but the Seattle meeting is evidence that there is still a wide gap which needs to be filled. *Western Industry* is hopeful that the good sense of all those who attended the Seattle meeting (and those others who logically should have been there also) will be manifested in a willingness to hold more meetings. A common peril to the West undoubtedly would serve to provoke unanimity of feeling on the particular point in question at that time and probably on other related matters also, but it would be far more business-like not to wait for an emergency to arise.

Looking Forward and Backward

CLARENCE B. RANDALL, president of Inland Steel Company whose fiery defense on television of the steel companies' position brought him close to millions of Americans, is already familiar to many Western industrialists who heard his thought-provoking remarks on other topics last winter at meetings of steel warehouse groups.

Some may also remember his courageous stand in San Francisco in 1947, as chairman of NAM's industrial relations committee, when he argued that the trend toward area-wide or industry-wide negotiating must be reversed, in order to prevent the development of cartels on both sides.

The soundness of his contention has been amply demonstrated on one level in the present steel controversy. But he and other NAM officials were under heavy fire in San Francisco then from employers' organizations who felt that restoring negotiations to plant levels would simply enable a united labor front to pick off helpless employers one by one. They had had plenty of experience along that line.

Randall, Earl Bunting and other NAM brass insisted this was a long-range program, and that no employer would be expected to abandon group action until labor did likewise. That was five years ago. What will the picture be in 1957?

IN OUR MAILBOX

Everybody Should Have One

Editor, *Western Industry:*

Thank you very much for your courtesy in forwarding the February issue of your magazine. The article "Helicopters Open New Industrial Horizons in the West" is an excellent job and, as you say, is a very comprehensive round-up from the viewpoint of the operator.

I think it would be very advantageous if this could be placed in the hands of our Council members and I enclose a list of same. In addition, would you grant us permission to mimeograph this article with full credit for use in answering inquiries received here from many sources?

Our congratulations on the initiative shown in recognizing the importance of this new aerial activity and securing an authority such as Mr. Schlessinger as its author.

Cordially yours,

DON RYAN MOCKLER,
Helicopter Council
Aircraft Industries Association
of America, Inc.
610 Shoreham Building
Washington 5, D. C.

(Here is Eastern recognition of a Western authority. Need we say more?)

* * *

Plant Construction

Editor, *Western Industry:*

I am sure that you are pleased with the article that John Rex wrote for you. I think it covered the question "Construction Trends" in a most interesting and constructive manner. It should be useful to Eastern as well as Western prospects. I am glad to have it in my files.

GLENN STANTON, F.A.I.A.
President, American Institute
of Architects.
Portland

(The article by Mr. Rex, president of the California Council of Architects, in the 1952 Review and Forecast Number of Western Industry, *reviewed the current series of plant construction articles, pointing out that the Western plant trend is toward "more square feet per dollar and a beautiful daytime home.")*

* * *

Better Perspective

Editor, *Western Industry:*

The copy of your 1952 Review and Forecast Number has been received, and it certainly is a very interesting and informative document. It just so happens that I am planning a trip to the Northwest and West Coast, and a great deal of the information shown in your publication will be very helpful in some of my discussions with our Western distributors.

O. S. DOLLISON, Vice President
Lee Rubber & Tire Corporation
Youngstown, Ohio.

(The Review and Forecast Number is being increasingly recognized as a means for getting not only an overall picture of the industrial West, but also a good idea of the outstanding developments in a great many individual industries.)

What Size Building Do You Need?



Butler 12' x 18' Packaged Building.

There's a BUTLER BUILDING to Fit Your Requirements

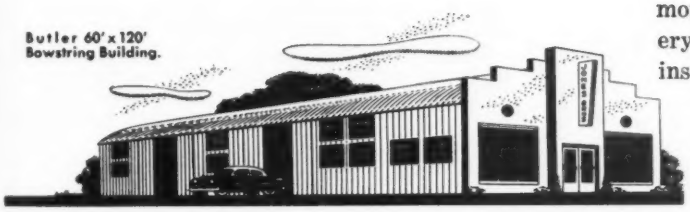
Butler 36'x84' Rigid Frame Building.



Yes, low cost, fire-safe, adaptable Butler Buildings answer your need for variations in width, length, height. Butler straight sidewalls and clear interior construction assure full usable space. And you can *build today* with Butler Buildings.

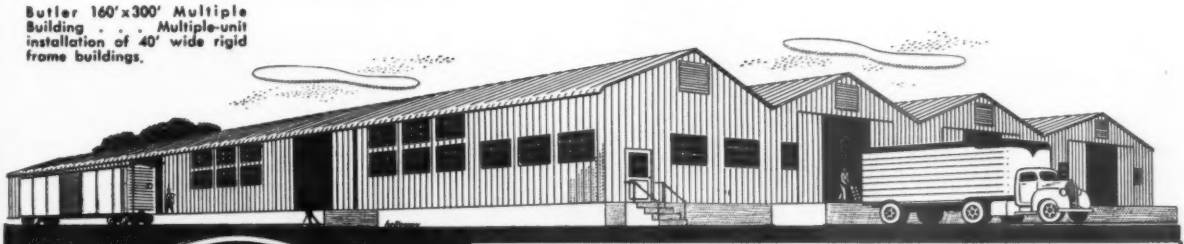
Butler Buildings are made at our Richmond, Calif., plant, for convenient delivery to West Coast industry. In days instead of weeks, your Butler Building can be ready for long-life use. For a Butler Building to fit *your* needs, see your Butler dealer or mail coupon today.

Butler 60'x120' Bowstring Building.



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Butler 160'x300' Multiple Building . . . Multiple-unit installation of 40' wide rigid frame buildings.



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• Good light quickly pays for itself in increased worker output. And Appleton Lighting Equipment is precision-built to provide your personnel with the good light necessary for maximum efficiency, high morale.

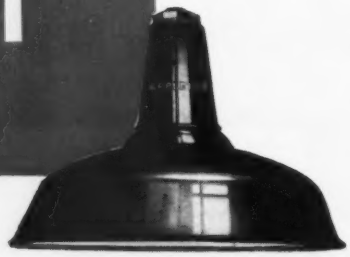
Appleton Fixtures are easy to install, easy to service. They're made to make the most of the lamp's power. Appleton reflectors distribute light evenly, without glare or troublesome fuzziness.

Plan lighting carefully for greater productivity per unit of personnel. And whatever your fixture requirements, specify Appleton, pace-setting manufacturer of electrical equipment for nearly half a century.



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Field Engineers in All Principal Markets

CALENDAR OF MEETINGS

May 20-23—Office Equipment Manufacturers Institute, at San Francisco. Contact E. D. Taylor, Ad. V. Pres., 1903 N. St., N.W., Washington, D. C.

May 21-23—Gas Appliance Manufacturers Assn., annual meeting, at Broadmoor Hotel, Colorado Springs, Colo. Contact H. L. Whitelow, Association headquarters, 60 E. 42nd St., New York City, N. Y.

June—American Society of Technical Appraisers, at San Francisco. Contact Robert Lauer, 408 Marion St., Seattle, Wash.

June—Third Annual Manufacturers Conference, at Oakland, Calif. Contact Ken Moeller, 427 Thirteenth St., Oakland, Calif.

June 1-4—Rocky Mountain Coal Mining Institute in Colorado Springs, Colo. Contact F. W. Whiteside, 936 Equitable Bldg., Denver 2, Colo.

June 8-9—Rocky Mountain Bakers Association conference, at Denver. Contact T. W. Kunde, 1727 Wazee St., Denver 17, Colo.

June 9-14—API Commission on Standardization of Oil Field Equipment, at Denver, Colo. Contact C. A. Yound, 816 Rio Grande National Bldg., Dallas, Texas.

June 15-27—5th annual Personnel Administration and Managerial Development conference at California Institute of Technology in Pasadena.

June 22-25—National Plywood Distributors Assn., at Hotel St. Francis, San Francisco. Contact B. E. Babitt, 20 N. Wacker Drive, Chicago, Ill.

June 23-24—National Concrete Masonry Assn., Board of Directors, at Hotel Fairmont, San Francisco. Contact A. G. Streblow, Basalt Rock Co., Napa, Calif.

June 23-July 5—Oregon State College 4th Institute of Northwest Resources at Corvallis, Ore. Contact Dept. of Natural Resources, Oregon State College, Corvallis, Ore.

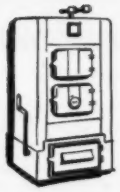
June 25-27—Pacific Coast Paper Box Manufacturers' Association convention at Arrowhead Springs Hotel. Contact H. H. Worth, 315 W. 9th St., Los Angeles 15 for further information.

July—West Coast Industrial Editors Conference, in Los Angeles, Calif. Contact W. H. Cole, 2700 E. Olympic Blvd., Los Angeles 23, Calif.

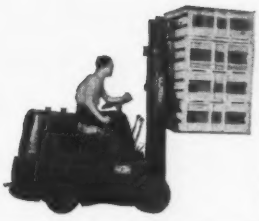
July 21-25 — Stanford University's 11th business conference for graduate school of business.

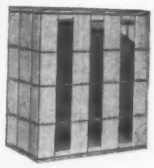
July 21-25—Conference on Clays and Clay Technology, at Berkeley campus, University of California. Discussion topics include the structure, fundamental properties, and meth-

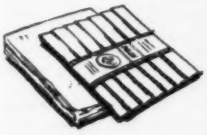
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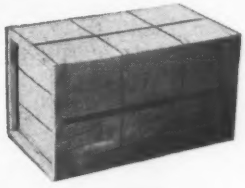
BOILERS





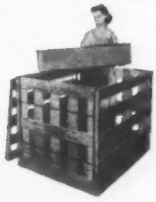


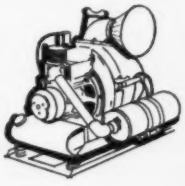
BACON



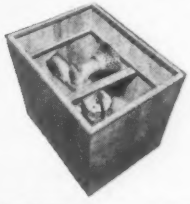


BOMBS



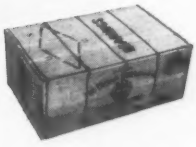


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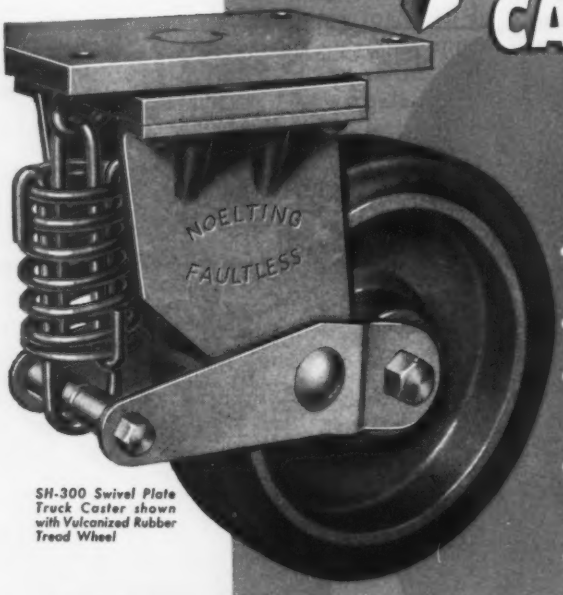
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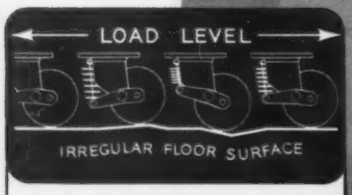
Our Product is _____ It Weighs _____

here's **LOAD PROTECTION**
on a New Level of Efficiency
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have these **EXCLUSIVE FEATURES**



SH-300 Swivel Plate Truck Caster shown with Vulcanized Rubber Tread Wheel

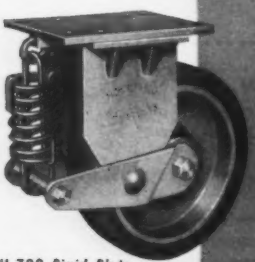
- 2 to 1 Lever Arm reduces shock—lengthens Spring life.
- Extended Wheel Offset for easier swiveling.
- Shock absorbing spring under compression lengthens life of bearings, raceways, wheel, etc.
- Springs of various load capacities easily interchanged to suit requirements.
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Note how large, long-lasting spring compensates for floor irregularities, eliminates bounce or shock, protects both load and caster.

This unique caster construction maintains a level load on trucks moving over irregular floors. Wheels contact floor surface at all times—eliminate bounce—don't raise truck when mounting obstacles.

Already time-tested by leading industrial engineers, this Caster is acclaimed for its use of standard, interchangeable wheels . . . absorption of high impact shocks through use of a large, durable spring *under constant compression* . . . spring and draw bar assembly a separate member. Write for catalog data with complete load capacities and specifications.



SH-700 Rigid Plate Truck Caster companion to SH-300 Series



S-H Casters take jolts out of water tanks for loading Air Line.



S-H Casters cushion mechanisms of jet engines moved over rough floors.

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Stocks carried for immediate delivery

CALENDAR OF MEETINGS

Begins on page 24

ods of identification and investigation of the clay minerals, and their uses in various fields of practical interest. Contact Dr. Joseph A. Pask, Division of Mineral Technology, University of California, Berkeley 4, Calif.

Aug. 11-13—Society of Automotive Engineers meeting, at Hotel Fairmont, San Francisco. Contact John A. C. Warner, Sec. and Gen. Mgr., 29 W. 39th St., New York 18, N. Y.

Aug. 12-14—4th Western Packaging and Materials Handling Exposition, Shrine Convention Hall, Los Angeles. Contact Clapp & Poliak, Inc., 769 Monadnock Bldg., San Francisco.

Aug. 19-22 — American Institute of Electrical Engineers, Pacific General Meeting in Phoenix, Ariz. Contact H. H. Henline, 33 W. 39th St., New York City 18, N. Y.

Aug. 27-29—Western Electronic Show and Convention, Long Beach Municipal Auditorium. Contact Heckert Parker, 108 Ninth St., San Francisco, Calif., HEmlock 1-2525.

Sept. 3-5—Pacific Coast Gas Association Conference, in Los Angeles, Calif. Contact Clifford Johnstone, 447 Sutter St., San Francisco 8, Calif.

Sept. 12-16—Tenth National Instrument Conference and Exhibit, Los Angeles, Calif.

Sept. 14-20 — Concrete Reinforcing Steel Institute, semi-annual meeting, at Broadmoor Hotel, Colorado Springs, Colo. Contact Association headquarters, 38 So. Dearborn St., Chicago, Ill.

Sept. 15-18—American Mining Congress Metal Mining Convention and Exposition, in Denver, Colo. Contact J. D. Conover, 1102 Ring Bldg., Washington 6, D. C.

Sept. 22-25—American Mining Congress, biennial metal and nonmetallic mineral mining convention and exposition, in Denver. Contact Society headquarters, 1200 18th St., Washington, D. C.

Oct. 11-14—National Association of Waste Material Dealers, fall meeting at Hotel Ambassador, Los Angeles. Contact association headquarters, 271 Madison Ave., New York.

Oct. 21-23—28th Pacific Coast Management Conference, at Claremont Hotel, Berkeley. Contact Everett Van Every, Secty.-Mgr., California Personnel Management Association, Farm Credit Bldg., Berkeley 4, Calif.

Nov. 10-12—California Fertilizer Association Convention, at Desert Inn, Palm Springs, Calif. Contact Sidney H. Bierly, Exec. Sec. and Mgr., 4700 District Blvd., Los Angeles 58, Calif.

typical western buildings protected and decorated with

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storage warehouse, Los Angeles



professional building, Pasadena



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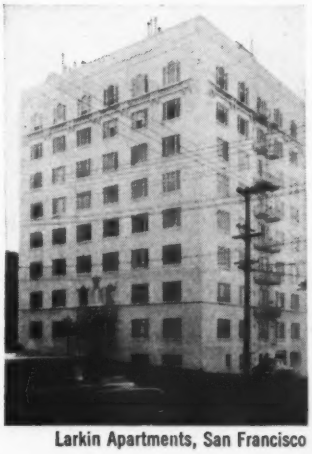
SYMENTREX is the decorative, water-resistant coating for concrete, stucco, masonry and brick surfaces.

SYMENTREX protects against water and weathering—guards against the destructive action of rain, frost and sun.

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SYMENTREX produces a soft, velvety finish of uniform natural color in either cement color, sandstone, maroon or white.

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The West is the fastest growing industrial region in the country. But older regions are going after new payrolls far more aggressively. In view of our industrial potential, we must ask ourselves . . .

Is the WEST GETTING ITS SHARE?

Finishing the job we started in January

IN AN ARTICLE by Mr. Walsh in the January issue of *Western Industry* entitled, "Six Questions About Western Industrial Trends," the sixth question was this: *Are Western communities and Western states effectively exploiting their industrial potentials?*

For lack of space, the question wasn't discussed in the January issue, but it was promised for early attention, and here it is.

The answer to this question depends, of course, on what the phrase "effectively exploiting" is supposed to mean.

IF WE ARE simply asking whether the West is achieving a substantial amount of industrial growth, the answer is "Yes." If we are inquiring whether the West is going after new payrolls as aggressively as other regions, the answer is "No."

What we really mean to ask is whether the West is getting all the industrial development it needs for its economic well-being, and again the answer is negative—with some qualifications which we can presently discuss.

By
STUART PARRY WALSH
Director
Industrial Survey Associates
San Francisco



The increasing competition of other states and regions was mentioned in the January article as a possible brake on Western industrial expansion. The Middle South, the Gulf South, the Great Lakes Basin, and the Mid-Continent have all been carrying on regional campaigns for new factory payrolls in the past few years, in addition to the individual efforts of states and local communities.

Meanwhile, increasing resistance to the Westward and southward movement of industry has appeared in the older manufacturing centers on the north Atlantic seaboard, including New England as a regional unit and state-wide programs in Massachusetts,

Maine, Connecticut, New York, New Jersey, and Pennsylvania.

These campaigns, which include national advertising as well as direct contacts, are carried on by regional and state organizations—the latter mostly tax-supported—and by railroads, utilities, "citizens' committees," and local chambers of commerce.

The governors of Rhode Island and Massachusetts have recently proposed million-dollar state revolving funds to finance the building of modern streamlined plants for new and established industries. In Tennessee and other southern states this is called a declaration of economic warfare by the North. Meanwhile, deep in the heart of Texas the rate of industrial growth is exceeding that of any other state, sparked by the aggressive efforts of a score of local communities, railroads, and utilities.

Without an equivalent amount of pushing, the West has had a higher rate of industrial expansion, measured in terms of the number of production workers employed, than any other region in the 1940-50 decade. While the greater part of this expansion has been in the three Coast states, and in a few areas within those states, several of the Mountain states have also had subtsantial development.

Shouldn't We Be Promoters Too?

If we have been doing pretty well, with prospects of continuing growth, is there any reason why we should try to match the promotional efforts of other states and regions? Do we have to worry about Texas, whose present industrial employment is about half that of California?

The answer, as already indicated, is that with all our industrial growth we can't afford to be complacent, because in most of the Western states the rate of population increase steadily threatens to outrun available employment. In the January article is was pointed out that the influx of people in the West tends to create more employment, but the process is not entirely automatic.

We must make sure that with all our new job *seekers* we also have enough job *givers*—enterprisers with capital or the ability to get it; managers with the skill to use it. This means that active industrial promotion is essential; we can't just relax and watch the West grow.

Most Western states and many Western communities need more year-round payrolls to correct the deficiencies of seasonal employment; they need more industrial tax revenues for essential services that residential property alone cannot support; they need more chances for young people to use their skills in the communities that have invested heavily in their education; they need more processing of raw materials in the areas where they originate; they need more production of goods which the growing markets of the West can absorb.

At this point we might stop and consider what the term "industrial promotion" includes. Any extended observation will identify at least five types of activity under that heading:

1. *Fact-finding and analysis* — to show just what a region or a community has, what it needs, and what it can do.
2. *Community preparation*—to improve facilities and enlist local cooperation.
3. *Publicity*—All the various forms of descriptive literature, newspaper stories, radio programs, speeches, etc.
4. *Advertising*—The use of commercial media as a means of seeking to reach new industrial prospects.
5. *Personal contacts*—The so-called "target-rifle" method as distinguished from the "shot-gun" method of No. 4.

While these five activities have been listed in a logical sequence they are not always used in this order, and in many cases only two or three of them are used at all. Sometimes No. 1 and No. 2 are omitted or skipped over lightly; No. 4 is used in relatively few situations; No. 5 is often somewhat neglected. Only No. 3 turns up in every promotional program.

The first two of the activities listed above appear to be essential in any sound promotional effort; the other three are important in varying degrees according to local circumstances. An examination of the merits and techniques of these activities would be interesting, but it is beyond the scope of this article; here we must stick to broader questions.

If industrial promotion should be a matter of continuing concern to Western communities for reasons already indicated, two other questions may be raised:

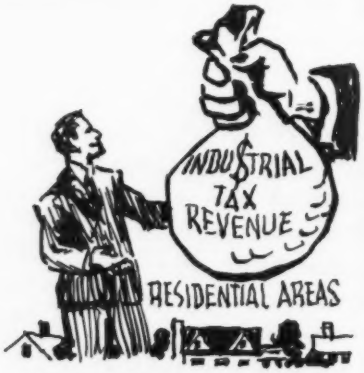
Should the West conduct a regional promotional campaign, as several other regions in the country are doing?

From a survey just made by Elmo Roper for the San Francisco Bay Area Council it is evident that many industrialists are considering new or expanded operations in the West, and also that they have many misconceptions about labor conditions, water shortages, plant sites, and other fac-

WHAT THE WEST NEEDS MORE OF



Diversify what you have, or acquire something new



Fair industry tax levels help bring new factories

tors affecting their decisions.

A region-wide effort to correct these impressions and to present the Western picture as a whole would seem to be quite desirable, but any present discussion of it is entirely academic, for there is no regional organization, established or in prospect, to undertake such a project.

Should more Western states and communities go into large scale promotional programs, including national advertising?

This is an "iffy" question, the answer depending on many conditions that differ from place to place. It may be useful, however, to suggest here a few basic considerations. For one thing, any program to be successful must begin with adequate attention to the first two items on the list of activities already mentioned. No amount of publicity or advertising will bring new payrolls unless facilities and conditions make a location profitable for industry.

Don't Race a Draft Horse

States and communities may justifiably spend money for industrial promotion if they really have substantial advantages to offer, *including good labor resources, adequate power and water, dependable transportation, attractive living conditions, and desirable plant sites.* Two other advantages that are of great importance, but less subject to local control, are raw materials and sizable markets. Communities having all the other inducements, plus one or both of these last two, can enter the competitive plant location race with added confidence.

Although almost every chamber of commerce claims all the foregoing advantages, investigation often finds some of them seriously deficient. Most of these deficiencies can be corrected, however, when the need for doing so is sufficiently recognized. That's part of the reason why fact-finding and community preparation are the first two items on the list of basic development activities.

Your Best Foot Is Probably Unique

It seems a safe guess that the activity for which more money is spent than for any other is promotional literature. In a recent report of a study of this subject entitled "Send for Illustrated Brochure," the Bureau of Research of the University of Santa Clara pointed out that most community industrial booklets look alike—in fact the text and pictures are practically interchangeable. Only in a few cases is there a clear presentation that makes a community stand out as a distinct and desirable place to locate a plant.

This may be due, as the report suggests, to a tendency on the part of copy writers to begin with a look at what others have done instead of finding out just what the local community has to offer. Or it may be due to other reasons which are discussed in the report. The point is that brochures and other publicity material deserve careful attention to make them worth their cost.

The same may be said of space advertising as a feature of industrial promotion. There has been a great similarity in the captions and text, and possibly some far-fetched claims, in the ads placed in *Fortune, U. S. News, Business Week, Nation's Business,* and other magazines and newspapers by state and local development organizations.

Few of the advertising writers achieve the hard-hitting simplicity of recent small insertions by the State of Nebraska: *"In this debt-free state where old-fashioned Americanism still prevails, you will find splendid labor, cheap electric power, abundant natural gas, unlimited water, freedom from crippling taxes, and a friendly-to-business attitude."*

If all this is true, Nebraska may be an important road-block in the Westward path of industrial migration. There are a number of executives, according to the Roper survey already referred to, who would like to move only part-way West, and Nebraska, like other mid-continent states, is bidding for those payrolls.



Why not advertise skills of your young-man-power?



This job is part research, partly overcoming inertia



Cost of high living does not stop people spending

None of the eleven Western states, and only half a dozen Western communities, are carrying on any national advertising at the present time. Most of the larger chambers of commerce are relying largely on personal contacts for new industrial payrolls, and many of them are using such contacts very effectively.

Advertising Dollars Come Back

While few cases can be documented where national advertising has been the direct means of bringing in a new plant, it does appear to have created identification and favorable attitudes for communities that have used it. Because it is expensive, it should be employed with great skill, as a part of a well-rounded program.

As restrictions on industrial construction are eased and as conditions become more competitive, Western states and communities will find it increasingly necessary to engage in sound promotional activities to get payrolls our growing economy needs.



AT LESLIE Salt Co.'s Baumberg, Calif., plant, salt is reclaimed from stockpiles by use of this Caterpillar D6 tractor, equipped with a No. 6S bulldozer. Salt next travels over 600 ft. of rubber belting from stockpiles to bins on nearby railroad gondola cars.

JUNIOR ACHIEVEMENT, a national movement sponsored by American business to give U. S. youth a firsthand knowledge of the free enterprise system, is given a boost by Bethlehem Pacific Coast Steel Corp. Bethlehem sponsors Wood Novelties, a business undertaking operated by one of the 44 Junior Achievement groups that meet weekly in San Francisco. These young industrialists make the product, keep books, plan sales campaigns and do virtually everything a regular business firm would. Wood Novelties manufactures quality wooden salt and pepper shakers. Left to right are: Eva Schlesinger, G. A. Lee, Bethlehem production advisor; Frank Taussig, Francis Faycosh, Lolita Fuerst, and R. A. Kuerst, chief advisor.



AN ALUMINUM casting for the vacuum tank of the cyclotron being constructed at Oregon State College, Corvallis, is examined by Elmer Neuhauser (left), Hyster Co. machine shop foreman; C. J. Filz, mechanician of OSC's physics department; and Walt Amann (right), operator of horizontal boring mill. This casting was machined especially for the college by Hyster Co., Portland. Cyclotron is being built by the school's physics department under a grant of AEC for research in atomic and nuclear physics.





HERE IS Long-Bell Lumber Co.'s answer to the wood waste problem. This is an inside shot of the company's factory for manufacture of kitchen cabinets. Material for this enterprise is wood waste which would otherwise be burned or sent out of the plant for utilization.

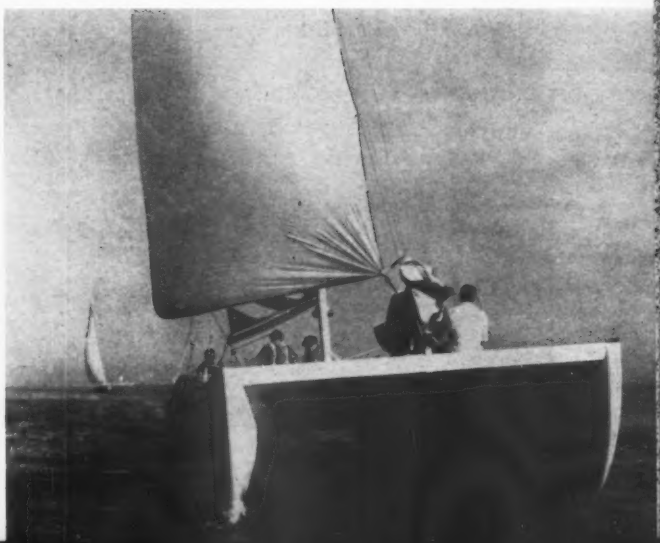
WESTERN PROCESSES AND PRODUCTS in Today's View



THIS POWERFUL trail of smoke is produced by take-off of one of Aerojet Engineering Corp.'s rockets. "Aerobee" is a vertical-ascent free-flight sound rocket used to obtain data from the upper atmosphere for scientific study. It is a two-stage rocket using a solid propellant booster rocket for launching and a liquid propellant sustaining rocket. Final velocity of the Aerobee is about 4,000 ft./sec., and it has attained altitudes of over 75 miles with 150-lb. payload. In order to protect photographic film and recorded data obtained on the flight, a parachute is released on the descent leg of the trajectory.



FOUR MEN STAND on the hood of a new plastic auto body to demonstrate its strength. These men are the four partners of Glasspar Co., Costa Mesa, Calif., who are producing this unit on a commercial scale. Body is dent-proof and rust proof. It is constructed of Naugatuck Chemical Co.'s Vibrin polyester plastic and layers of glass fiber. This combination makes a material which, for its weight is stronger than steel. Left to right are Jerry Niger, William Tritt, body designer and president of Glasspar, Otto Baeyer and Louis Solomon.



LEAR, INC., Los Angeles, has produced the first sailing cabin catamaran ever built in this country. Catamarans, as first built by the ancient Polynesians, were merely dugouts spaced apart by logs or a single platform and lashed together. Revolutionary arrangement of synchronized twin rudders makes the "Lear-Cat" extremely fast and maneuverable. Large comfortable cabin in each hull complete with bunks and lockers is an added feature. Here the "Lear-Cat" reaches out ahead of a cutter nearly twice her size during an impromptu race.

WOOD CHIPS SAVE the DAY

. . . for the Western pulp industry, as waste from 100 lumber and plywood mills becomes main source of supply for 10 kraft plants



By
HAROLD OLSON
American Forest Products Industries, Inc.
Portland, Oregon



Photo courtesy Puget Sound Pulp & Timber Co.

BARK IS BLASTED off whole logs by hydraulic barkers using pressures up to 1,400 psi. It's efficient and fast, but expensive. Mechanical barkers within price reach of smaller sawmills could increase chips supply to feed 30 kraft mills, instead of 10.

AN AVALANCHE of wood chips, enough to load two long freight trains every 24 hours, has the West's forest industries peeking at hole cards these days. It's chips, chips, everywhere, as a lusty new giant shapes up within the industry.

At least 100 lumber and plywood mills are producing "white wafers" for use in 10 kraft pulp mills of four states. The volume is huge. And all is from salvage.

Briefly, what has happened is this: Bark-free chips from humble leftovers at plywood and sawmills have become a main source of raw material for the large and growing kraft paper industry of Washington, Oregon, Idaho and California.

Glamor for the Unwanted

They have already displaced close to half the logs formerly needed in supplying this division of the pulp and paper industry. Before long an estimated 70 per cent of the entire wood needs of these 10 mills, plus one now being built, is believed destined to be filled by chips from this source.

It's glamor for the unwanted, a new Cinderella story of the woods. Some hail it as one of the great milestones in the forest industry's struggle towards a high level of utilization. Yet despite its scope it's fairly new. It has swept onto the scene largely since 1948, and all but unheralded. Its immense proportions, disclosed by recent surveys, surprised even best-posted industry leaders who have had a hand in it.

The intriguing new giant is a mighty saver of timber. At least 400 million feet a year are already chalked up as the "stretch" given the old growth timber supply by recent chips progress. That puts white chips in the blue chips class for sure, because it means they save 8,000 acres of old-growth annually — postponing this harvest, giving the new crops on the tree farms more time to mature.

And the rate is increasing, too, with more chipper installations all the time to serve expanding paper and hardboard factories.

From Thin Air

Actually, the kraft paper mills of the four states, now operating full blast at about 2,750 tons capacity daily, are getting at least 1,300 tons a day—roughly half the current total output—from the little white chips that not too long ago were mostly expensive nuisances in the lumber and veneer mills. It is like reaching into thin air after a freight train load of pulp every 24 hours, and getting it, without cutting a tree.

Clean slabs, edgings and trim at sawmills, and veneer pieces graded out by clippermen at plywood plants are the backbone of the huge new business. Formerly such by-products of sawing and peeling could expect no fate more lofty than fuel.

But they are not scorned now. At today's fancy cost levels for logs, economics have cured an industry headache. Leftovers once scorned now can pay their way. Processed into desired sizes and touched with chemistry's magic at the pulp mills, they have added a vast new field of usefulness to their own account.

It took the sulfate, or kraft, mills to bring this about. Only they can pulp Douglas fir, pine and other resinous woods. In fact, kraft mills can use almost any kind of bark-free wood in the pulper.

All In a Decade

All this started some 10 years ago in the final days of the cheap timber era. With the war came production difficulties in the woods that put the log supply on an unaccustomed pedestal. Casting about for new sources of fiber to meet enormous war demand for paper products, some pulp mills began developing slab barkers to make use of sawmill residue. These went hand in hand with big hydraulic log barkers and whole-log chippers that made their debut about that time.

Special sawmill chippers were devised to process clean pieces picked from refuse conveyors. At the Sumner Iron Works in Everett, Washington, Inar Flateboe and his master mechanics designed a chipper of a different type to handle veneer rejects. Both took hold only gradually at first. Then, about two years ago, things started snowballing.

Today 43 veneer mills have installed chippers to make a cash item out of residue chippings. More are on order. An average veneer chipper turns out about a railroad car daily—20 units of 200 cubic feet each. Forty units a day is not unusual. A unit of chips represents about eight-tenths of a cord of pulpwood logs. A thousand feet of timber, log scale, would equal about 2½ units of chips.

At the same time, sawmills of the Douglas fir, Western Pine and California Redwood regions stepped up their shares in this new business. From El Dorado to Vancouver Island, from Westport to the Clearwater they began tieing in with the kraft mills. Some installed hydraulic log barkers to blast off the bark and make all solid leftovers fit for chipping. In two years nearly 30 mills put in chippers. At least as many more contracted to ship slabs and edgings to pulp mills, where central slab barkers and chippers did the job.

How They Travel

Pulp chips currently are being hauled by truck and trailer upwards of 100 miles, although 70 miles is considered an average maximum for that method. Trailer rigs can move up to 10 units at a time.

For railroads, the economic haul limit is established at 200 miles. This is flouted by a 350-mile haul in California. Chip transport by barge is apparently limited only by waterway confines. Factors such as volume and dependability of supply enter into economics of the business but transportation costs play a most vital part today.

As examples, pulp chips travel today from Chester and Arcata to Antioch, California; from Coos Bay to Springfield; from a dozen western Oregon points to Columbia River mills; from Hoquiam to Anacortes; from the Yakima Valley to Tacoma. Before long a master chipping plant at Eugene will draw wood leftovers from a dozen Lane County sawmills to be processed for Longview Fibre Company's great kraft mill at Longview. Foster to Oregon City, Valsetz to Camas, Aberdeen to Longview are not unusual hauls.

Near Saturation Point?

O. W. Dexter, Crown Zellerbach production executive at the Seattle office, said growth of the purchased chips trade has been so swift in recent years that "the saturation point may be upon us before we know it." He said the chips boom is rapidly settling down into its permanent stages in which the best sources of supply with the shortest hauls naturally are in preferred position to market chips.

Nevertheless, there are still opportunities for mills with residue problems if they are within economic reach of paper or board mills.

James C. Hayes, wood boss at Everett Pulp & Paper (which recently became a unit in the integrated forest industry program of Simpson Logging



DOLLARS FROM LEFTOVERS—From spouts such as these at Western lumber and plywood mills, a huge stream of wood chips is now flowing to a companion industry, kraft pulp. Leftovers of lumber and veneer manufacturer thus supply today raw material for about 1,300 tons of pulp daily.





GIANT SUMNER CHIPPER at Crown Zellerbach Corp. kraft paper mill in Port Townsend, Wash., can reduce a log 20 ft. in length and of 42-in. diameter to chips in from 20 to 25 seconds.

WOOD WASTE formerly burned at mills, now furnishes in the form of chips the annual wood supply of Crown Zellerbach's mill at Camas, Wash., largest specialty paper mill in the world.

Co.) said one more step is needed to cap the climax of this great utilization story.

Needed: A Lower-cost Barker

"We need a good mechanical log barker within price reach of medium and small sawmills," he said. "The big hydraulic barkers are too costly for smaller mills. Yet the place to remove the bark is before the log goes into the sawmill. When more mills can do it, the chips supply might be great enough to feed 30 kraft mills instead of 10."

Some folks might wonder why all this wasn't done years ago. The answer is, it couldn't be done then. Economics of the thing made the use of logs preferable. When it started to pay to use these chips, the transition was swift.

The surge of chips so far has just about made obsolete a state-wide inventory of unused wood materials made only three years ago by the Washington Institute of Forest Products.

"We estimate now," said Director Ralph G. De Moisy, "that a re-inventory in 1952 would show less than 50 per cent of the solid residuals at sawmills that we found in 1948-49. This means a reduction of 10 million cubic feet annually of material formerly considered a nuisance but now being utilized for the manufacture of consumer goods. By 'solids' we mean slabs, edgings, trim—not sawdust, bark, shavings or hogged fuel, which have changed very little."

Goodbye, and Hello

It's a story of Western people making more out of their basic resources. With this vast flow of chips coming chiefly from leftovers of the mature timber harvest, fast-growing young timber on the tree farms can be left to stand longer and put on more cellulose and board feet.

The whole thing reminds folks of the noted movie of a few years ago, with some changes of characters. This time lumber and plywood makers say "Goodbye, Mr. Chips" and the pulp and paper mills make it "Hello, Mr. Chips."

WESTERN INDUSTRIES HELP EXPLORE THE ATOM

. . . by solving "impossible" problems to develop a clear and dense leaded glass



By

JOHN M. HOLEMAN

Recent winner of the General Electric Company's highest award—The Coffin Award—for his work at Hanford Works in optics and glass

FOR ABOUT 70 YEARS—until 1949—glassmakers considered a large piece of very dense leaded glass impossible.

Glass containing up to 40% lead was readily available for optical uses, but attempts by manufacturers to further increase lead content in optical glass failed consistently. The lead oxide used would crystallize to produce an opaque mass, or the color would be too dark, or the glass contained too many bubbles for good transparency.

Why Leaded Glass?

Glass with an extremely high lead content would solve a persistent problem plaguing design engineers at the Hanford atomic plant in 1949. That problem was: how to safely direct and watch the handling of radioactive materials from remote positions. A window made of densely leaded glass would protect the viewer from the effects of radiation.

Western Industries Cooperate

The story of how this problem was solved is a story of cooperation between big and small Western industries. A small Seattle instrument company used its initiative and ingenuity to develop samples of extremely dense lead glass. These were tested in the immense facilities of Hanford Works, which the General Electric Company operates for the Atomic Energy Commission, until a suitable glass was found.

This story of teamwork began in the fall of 1949. A large expansion program had been approved by the AEC, and GE design engineers were beseiged with the problems attendant to expanded plant operation.

The questions about an improved leaded glass centered around an elongated steel box called a "cave."

In these caves, radioactive materials were handled by remote control. The walls of the cave protected the handler from contamination, and a large glass window allowed him to safely view the activity.

Of course, engineers had solved this viewing problem before 1949; but the solution, though effective, was discouragingly unwieldy. It consisted of windows made from 22 sheets of one-quarter-inch X-ray glass laminated with liquid cements. These sheets were mounted in 8 x 12-inch frames which were then inserted in steel walls.

The windows thus formed were thicker than the walls—the logical development of using glass with but two-thirds the density of steel. They protruded from the walls enough to cause severe design problems.

The expansion in 1949 re-emphasized these problems and the laborious method then used to assemble the windows. Also, the proposed new cave design called for a larger view opening. The most desirable solution — then considered impossible — was a large piece of very dense lead glass.

Extensive Research Required

The amount of the possible contract for 50 such pieces of glass was $40,000. The large commercial glass companies were not interested. Forty thousand dollars worth of business would not justify the research cost, they said. Others replied that their research force was fully engaged, or that they were not interested in lead glass.

Nor did the optical companies wish to undertake the necessary research,

BEHIND A WINDOW of heavily-leaded glass, a G. E. engineer manipulates levers to pour radioactive solutions. The glass stops dangerous radiations as effectively as surrounding steel, and eliminates protruding window that caused design problems.





REMOTE HANDLING of radioactive materials at Hanford Works is accomplished by lever-control of moving crane observed through dense lead glass window. In this case, the glass provides as much protection from radiation as thick concrete wall in which it is recessed.

instead, they suggested alternative solutions.

One proposed to make the window from six one-inch thick sheets. Such a window would have been easier to assemble than the 22 sheets of X-ray glass and would have had better light transmission. However, it would have been as thick as the original window and much more expensive.

Another company suggested not a lead glass, but one containing a denser, less penetrable, element. And, although this possibility was considered, the decision came automatically when the company, for health reasons, discontinued making the glass.

By 1949, the National Bureau of Standards had also developed samples of heavily leaded glass. All of these samples, however, were dark colored and full of bubbles—so full that the density suffered. Many of the earlier samples had already crystallized to an opaque, crumbly mass; one, containing about $8,000 worth of ingredients, had been a total loss.

Armed with this information, the Seattle instrument company tackled the specific problems: how to make a heavily-leaded glass that wouldn't crystallize, wouldn't change to an opaque material, or capture so many bubbles as to reduce its protective quality.

Solutions Offered

Rapid cooling was the answer to the crystallization problem; for by quickly reducing its temperature, the mass would "gel" too fast for crystal growth.

However, most glasses do not readily conduct heat; therefore, in 1949, such rapid cooling could be applied only to very small pieces of glass. How to thoroughly chill a large piece of glass—inside and out—is still a valuable secret of the Seattle company.

Up to 1948 the yellow color of lead glass was generally believed to be due to the lead, to iron present as an impurity, or to an interaction between the two. However, in that year a worker at the Chance Glass Works in England discovered that other factors were chiefly responsible. By using platinum pots instead of the usual clay, and by using extremely pure ingredients, he succeeded in producing small colorless pieces of fairly dense lead glass. Through the efforts of the Atomic Energy Commission, the Seattle company obtained on loan, the vital—and expensive—platinum crucible for its research work.

The bubbles in lead glass result from adding an oxidizing agent to the melt. This process liberates oxygen, which, while it makes the glass clear, also forms bubbles in the melt. These bubbles, of course, reduce the density of the glass and complicate the original problem.

The Seattle company evidently solved this problem also; for within a few weeks after the original contact in the fall of 1949, it was sending us samples of the clearest and densest lead glass we at GE's optical shop had ever seen.

Tests at Hanford

During most of the year, our shop tested nearly 40 different melts. We measured the density and refractive index, polished the sides and measured surface reflection and transparency. We examined them for color and exposed them to all kinds of radiations available at the Hanford Works to note darkening effects. (Most kinds of glass turn dark and lose their transparency when exposed to various intense radiations.) Many of the samples were reannealed, repolished and exposed several times.

This Is It

We concluded that these samples had a density high enough for use in our equipment, a refractive index highly favorable to making viewing windows, and a very light yellow color.

The shielding equivalent of the glass was somewhat higher than steel and about two-thirds that of lead. Also, the samples which had been exposed to penetrating radiations were darkened far less than ordinary glass—and the darkened color tended to fade at room temperature.

During the last two years, the glass has been made into bricks the size of regular lead bricks, into plugs seven inches in diameter and ten inches thick, and into windows 18 x 24 inches and a foot thick. Every shielding test has shown it to be more effective than the same thickness of steel, and none of the glass has ever darkened in use from radiation exposure. The maker has perfected a method of mounting windows in metal frames for easier handling and applying very effective low-reflection coatings to the surface.

The ingenuity of small business, working with the immense facilities of government and big business, had come through.

NEW TOOL
with built-in skill
ELIMINATES HUMAN ERROR

"Master tooling dock," first unit based on the concept of geometric tooling, has saved more than $10,000,000 in the aircraft industry, and new applications keep appearing

ALTHOUGH it may be regarded as a by-product of the mathematical principles to which most of us were exposed before leaving high school, "geometric tooling" is considered a new and revolutionary concept in some of America's largest industrial organizations; for, in addition to having already solved many vexing production problems, it represents a source of ideas for new developments which should be a matter of interest to technicians and craftsmen of all types.

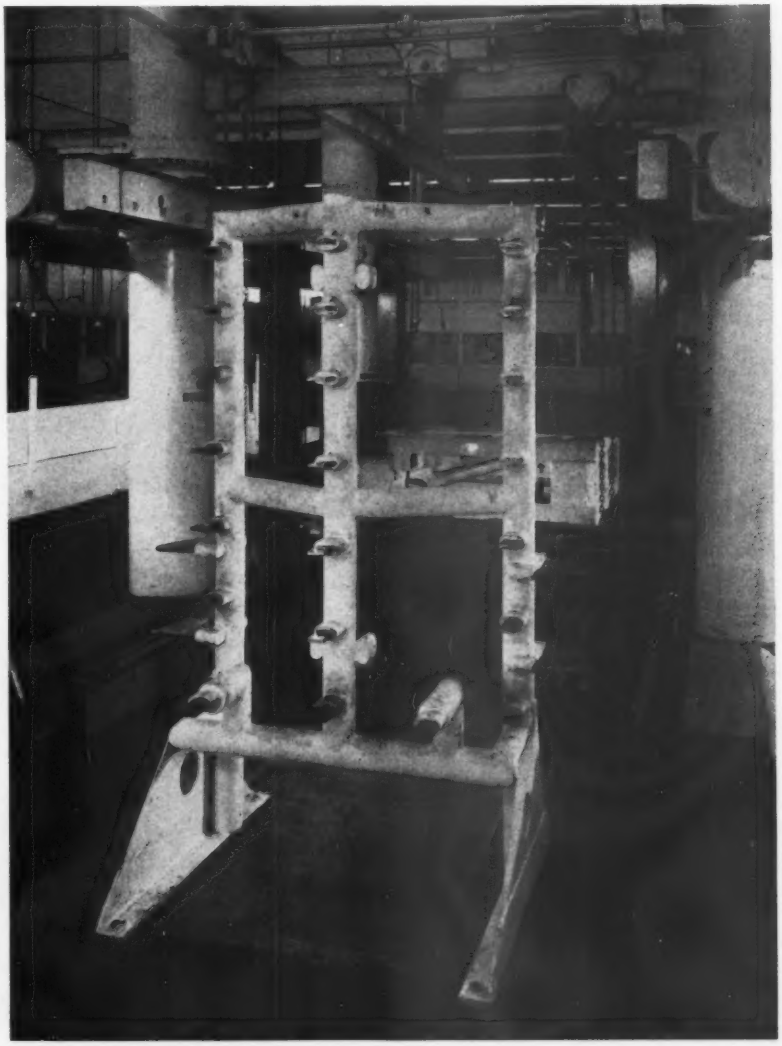
Not Enough Dimensions

As initially developed by Leland A. Bryant & Associates of Los Angeles, geometric tooling might be described as the first precise method of finding a third-dimensional point in space. This has been an item of particular importance in the fabrication of assembly tools, because the latter had to be made by trial-and-error methods with one- and two-dimensional measuring instruments prior to the use of the first geometric unit—a device known as the "master tooling dock."

Too Many Man-hours

An assembly tool is a jig or fixture which aligns and holds the components of an airplane, automobile, boat, or similar structure so that the parts can be mated by riveting, welding, bolting, etc. Fundamentally, each of these tools comprises a frame or "rough structure" on which a series of "formers" or locational elements are mounted. It's easy enough to construct the frame of an assembly tool, since its only purpose is to support the formers; but, if the formers aren't aligned in the third dimension with reasonable accuracy (tolerances averaging less than 0.002 inch), trouble can be expected. Parts can't be mounted correctly for

PORTABLE tooling dock now in use at North American Aviation plant in Los Angeles.



assembly work, holes for rivets and bolts won't be properly aligned, etc.

Where one- and two-dimensional measuring instruments (such as micrometers and surveyors' transits) have been used, thousands of man hours have been required to mount formers on one relatively small assembly tool. With the master tooling dock, each former can be rapidly and accurately located in one rapid sequence of routine operations by means of steel "straightedges" which are fundamentally the same as the straightedges used by draftsmen in finding two-dimensional locations.

What It Is

In essence, the tooling dock is a rectangular steel superstructure within which four longitudinal straightedges are rigidly mounted for the alignment of two vertical and two transverse straightedges which are movable. Each straightedge has a series of precision-drilled holes at 10-inch intervals and a lengthwise T-slot.

Purpose of the holes in each straightedge is to match the holes in one edge of a master gauge or "strip template," so that the latter can be mounted on the straightedge by means of dowel pins. A strip template is merely a strip of steel with holes drilled in two edges; and, when mounted, it extends beyond the straightedge so that the holes in its projecting edge will respectively designate one-dimensional tooling locations between the holes on the straightedge. This in turn makes it possible to mount a metal fitting at each one-dimensional tooling location by means of a T-bolt in the slot on the straightedge. The number of strip templates used in operating a tooling dock is proportional to the dimensions of the tools and products that must be made because the tooling locations designated by the templates are the one-dimensional points which are essential to the design of any article.

How It Works

In the operation of a tooling dock, the first dimension in space is initially established by using a strip template as noted above to mount a fitting at a given location on each longitudinal straightedge. Then a pair of vertical

. . . Concluded on page 42

What geometric tooling can accomplish

GEOMETRIC TOOLING has been proved fundamentally practicable in actual production work over a period of 10 years, and still new applications keep appearing.

Briefly, this is how it works: formers are templates or locational elements that must be precision-mounted on the so-called "rough structures" of assembly jigs or fixtures. Prior to development of the tooling dock, they had to be aligned with one- and two-dimensional measuring instruments, such as the surveyor's transit, micrometers, plumb bobs, etc. This necessitated a lot of hit-or-miss experimentation, due to human errors.

A tooling dock reduces the process of finding a third-dimensional point in space to a sequence of routine assembly operations, which virtually eliminates the possibility of human errors.

This saves about 50% to 75% of the time that was once required to align, proof, realign, etc., each locator or former.

Critical dimensions on tools assembled with a tooling dock are accurate to within tolerances of plus-minus .002", whereas tools otherwise produced are rarely accurate within tolerances of plus-minus .009".

This is important in production work, because men using dock-set tools do not have to waste a lot of time selectively fitting, trimming, and otherwise adapting parts to the dimensions of their assembly jigs or fixtures. Also, it eliminates the possibility that subassemblies will have to be scrapped because they cannot be mated properly with final assembly components.



FITTING MOUNTED on the transverse straightedge of a master tooling dock enables Consolidated Vultee aircraft workers to find a third-dimensional location with maximum speed and precision in the fabrication of an assembly fixture.



REVERE BRASS TUBE HANGS UP 25 MILES OF LIGHT

In the General Accounting Office Building in Washington there are luminous indirect fluorescent lighting fixtures which if put end to end would reach across country for 25 miles. This is possibly the most spectacular fact about the installation. So many lighting units are needed in this seven-story structure because it occupies an entire city block and has no court to admit daylight to interior areas. There are 10,000 employees, and large numbers spend all their working hours under electric illumination. The reflectors are made of extruded Plexiglas acrylic plastic, and deliver 90% of the light to the ceiling, from which it is reflected downward, preventing glaring dazzle spots. There are nearly 33,000 lighting units in the building. A Revere man who visited the office reports that the lighting is perfect.

The units or luminaires were made by the F. W. Wakefield Brass Company, Vermilion, Ohio, using Revere Brass Tube for the hanger stems. At one end the tube had to be threaded for a length of two inches and flared at the other. The stem is then chrome-plated. Brass lends itself ideally to these operations. Revere will gladly collaborate with you on the specification and fabrication of Revere Brass.

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NEW TOOL ELIMINATES ERROR

. . . begins on page 39

straightedges are respectively attached to two fittings on the longitudinal straightedges, and the second dimension is established by using a strip template to mount a metal fitting on each vertical straightedge. Next, a transverse straightedge is attached to the fittings on the vertical straightedges and the third dimension is fixed by using a strip template to locate a fitting on a transverse straightedge. Two transverse straightedges and fittings are used simultaneously in most cases to position the upper and lower portions of each former.

Savings Are Tremendous

Maybe it sounds simple, but the master tooling dock has already saved more than ten million dollars in the aircraft industry alone. And it's still so new that it isn't being used as extensively as might be expected in any industry!

Meantime, other geometric tooling ideas are being developed. For example, there's the universal jig borer;

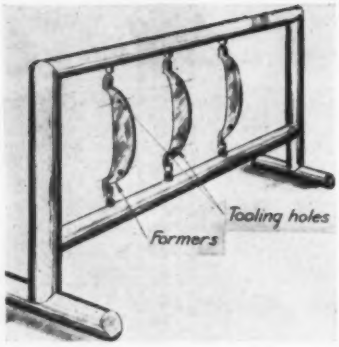


DIAGRAM of locational elements mounted on the rough structure of a small picture-frame assembly fixture. Such locators or formers must be aligned with extreme precision in the third dimension if interchangeable assemblies are to be produced with this tool.

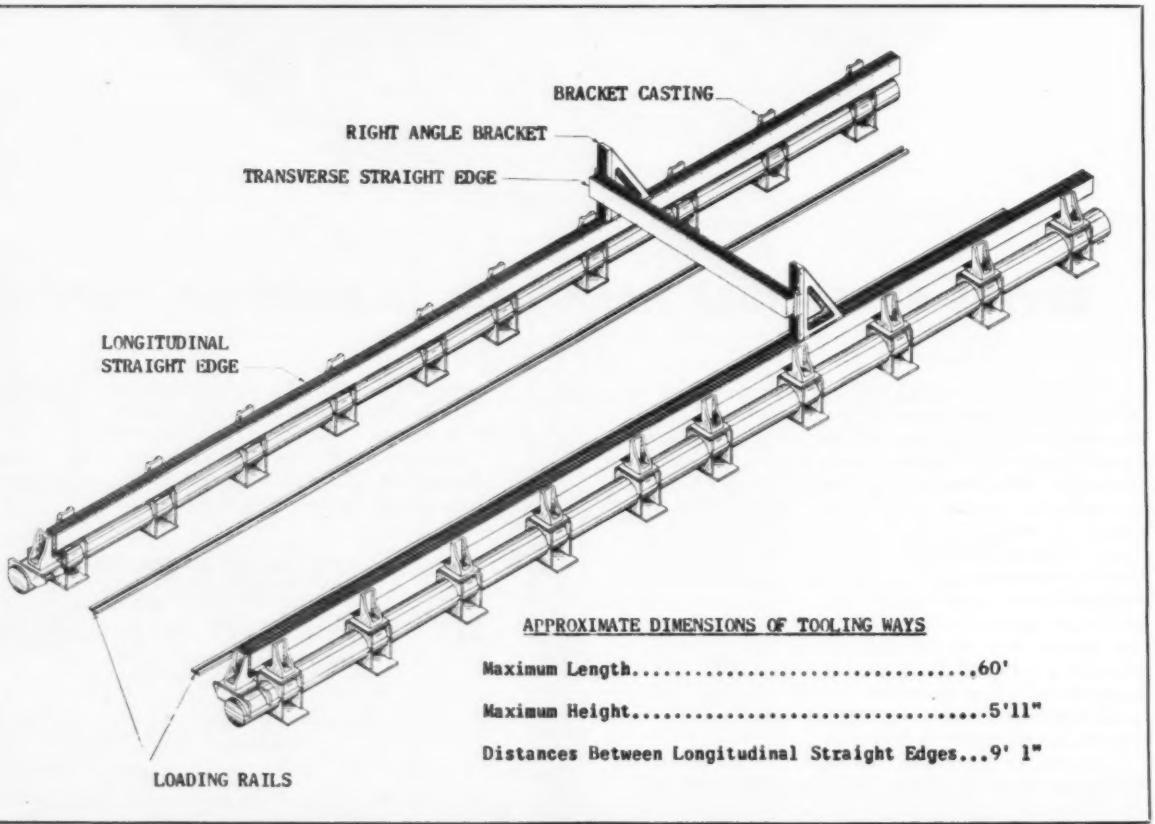
it has a pair of longitudinal straightedges, on which a movable transverse straightedge is mounted. The transverse straightedge is used to support a fitting, similar to the fitting which establishes the third dimension in a tooling dock, so that a bushed hole in the fitting can be used as a guide for drilling or boring holes in materials beneath the transverse straightedge. This, of course, saves the cost of constructing a new jig for each different part that must be drilled or bored with maximum dimensional accuracy.

Then there's the "tooling ways," a cut-rate version of the tooling dock. This device has a pair of longitudinal straightedges on which two triangular members are mounted to provide vertical supports for a transverse straightedge, and it can be used to locate points in space where the large dimensions and minute accuracy of a tooling dock are non-essential.

Master Paneling Fixture

Also, there's a new Bryant invention known as the master paneling fixture. It comprises two vertical sections of steel casing, on which a pair of straightedges are horizontally mounted —the lower straightedge being stationary, while its mate is movable up or down. This saves the cost of building a new rough structure every time a new assembly tool is required, since locators can be taken off the fixture and the upper straightedge can be adjusted so as to accommodate new locational elements whenever necessary.

INEXPENSIVE TWO-DIMENSIONAL VERSIONS of the master tooling dock, such as the "tooling ways" shown here, have been used to produce accurate assembly tooling for products that did not require extreme coordination in the third dimension.





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Planned lighting aids plane builders at Lockheed's Bakersfield Plant

—Report on sub-assembly plant for Lockheed Super Constellations



Average horizontal illumination above is 63 foot-candles; mounting height about 14 feet

For the exacting work at the Bakersfield plant of Lockheed Aircraft Corporation, special lighting was planned to provide a high level of glareless intensity. The installation consists of 480-500 watt incandescent lamps in RLM reflectors spaced on 11-foot centers.

Modern lighting such as this has made it practical for many leading industries to operate two and three shifts with equal output. Case histories of planned lighting results in businesses similar to your own are on file at P. G. and E. We'll be glad to send these lighting success stories to you on request.

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ACCURATE PRODUCTION CONTROL

based on

ATOMIC ENERGY



CONTROL PANEL for the new Beta Ray gauge now in use at Gates Rubber Co. Chart indicates relative thickness of rubberized fabric while fabric is in manufacture, and gauge immediately detects changes in density as well as weight per square yard.

DEVELOPMENT of the Beta Ray gauge has been a major step forward in the technical control of production quality, according to C. H. Mingle, vice president of Gates Rubber Co., Denver, Colorado. At this writing, Gates Rubber Co. is employing such a gauge to control the square yard weight of rubberized fabrics.

Unlike other measuring instruments, the Beta Ray gauge does not use a high-powered outside source of energy; it operates solely upon the self-contained energy of a particle of Strontium 90, and makes use of the same principle pictured in "Industry Embraces the Atom," published in *Western Industry* in December, 1951, page 37. (See also *Western Industry*, April, 1951, page 35, "Use Atoms in Your Plant.")

The unit used by Gates Co. is manufactured by Industrial Nucleonics Corp., Columbus, Ohio. It will detect changes in square yard weight of rubberized fabrics at .00 pounds. Density changes in the fabric are also detected, since these factors are interdependent. This is the first time that the rubber industry has had a means of accurately determining square yard weight continuously. It has eliminated the activity of cutting out samples, which then had to be weighed in a laboratory balance. (Sampling of this type caused excessive scrap of otherwise production material, as well as a delay in knowing the weight of the fabric.)

Detection is made while the fabric moves along in regular production. This is how the unit works:

Radio-active Strontium 90, a by-product of the Oak Ridge atomic furnaces, is installed in a stainless steel case in the lower part of the machine. Fabric passes above it. Several inches above the fabric, and placed directly over the lower case containing the Strontium 90, there is located a cylindrical ionization chamber. Those two units compose the actual detection apparatus.

As the fabric moves along, Strontium radiation flows upward from the lower chamber to the ionization chamber. Since thin areas in the rubberized fabric will permit more radiation to pass through, fluctuations in sheet thickness are immediately registered by the detector. These fluctuations are then converted into electric impulses that register a jagged line on a moving chart, in terms of pounds per square yard.

CHAMBER above the fabric (the cylindrical ionization chamber). Radiation from particle of Strontium 90 passes from chamber below the fabric upward, through the fabric and into this ionization unit, where fluctuations of radiation, dependent upon fabric thickness are registered, transformed into electric impulses and recorded in chart form.



Stacking goods UP cuts costs DOWN

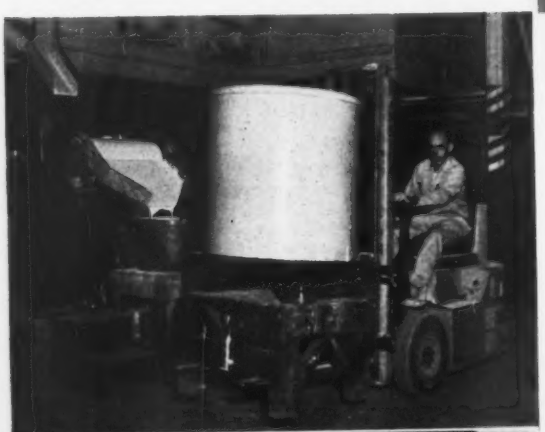


STACKING pallet loads of resin in steel drums three loads high. Previously, all handling was done by hand with floats and hand jacks.



REMOVING 2,000-lb. load of white pigment from storage for haul to mixing room.

FOR FILLING large pails, tubs of paint are placed on a higher platform to allow sufficient room for filling. In view below, lift truck is moving a tub and platform through the milling room. After each use, paint tubs are taken to cleaning area outside of the plant. In view at bottom, lift truck is placing clean tub on platform for haul to the milling room.





A GRADUAL CONVERSION to modern lift truck handling has been taking place during the last few months at the Old Colony Paint & Chemical Company in Los Angeles. Old Colony recently installed a 2,000-pound capacity lift truck to increase efficiency in handling bags of pigment to and from storage, the movement of material from warehouse to elevator and many miscellaneous jobs.

On arrival, all bags of pigment are palletized and stored in the warehouse three loads high with the lift truck. Resins in metal and paper drums are palletized and also stacked three loads high.

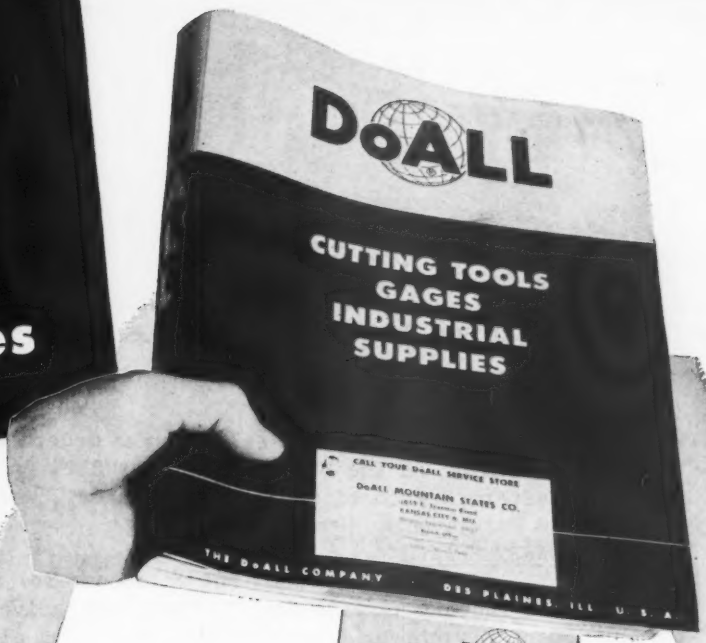
All this material will eventually be handled by the lift truck. Because of insufficient elevator capacity pallet loads of pigment are placed by the truck on a float and then placed in the elevator. By means of a hand jack the load is removed onto the mixing floor and hauled to the mixers. This haul is only a matter of a few feet. Quite frequently the lift truck is used in the milling room for lifting or moving tubs of paint.

Because of the hazardous operation involving a highly inflammable product, Old Colony has "ignition proofed" its truck in the manner used by the oil company operators. This safety precaution is a necessity where explosive chemicals and gases are involved.

Prior to the installation of the lift truck all handling was done entirely by hand with floats and hand jacks.The management of Old Colony reports that in just the two months since they began modernizing their operations using the lift truck there has been evident a great savings in operational costs and a saving in warehouse space.

This last item has proved to be the outstanding advantage. More space made available by high stacking allows for a greater inventory and buying in larger quantities.

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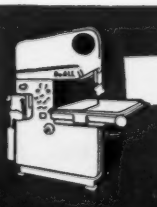
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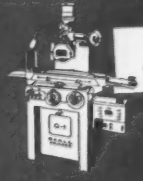
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HIRSCHMANN HIGHLIGHTS

ABOUT PRECISION MACHINE TOOLS

PUBLISHED BY CARL HIRSCHMANN COMPANY, MANHASSET • LOS ANGELES • MILWAUKEE — MAY, 1952

NEW WESTERN BRANCH

Largest selection of modern high precision Swiss machine tools displayed on the West Coast is at 5124 Pacific Boulevard, Los Angeles, Western Branch of Carl Hirschmann Co., whose executive offices are at 30 Park Avenue, Manhasset, N.Y.

NEW MIDWEST BRANCH

Showrooms and warehouse for complete machines, spare parts and factory service for all lines exclusively represented in U.S. by Carl Hirschmann Co., is being developed at 525 E.Michigan Street, Milwaukee. Russell T. Gilman is Executive Director.

PRECISION BALL BEARING MANUFACTURING

Precision Ball Bearing Manufacturers have taken a decided interest in Tornos Automatics for bearing races manufacture. Tornos Machines, slower than multiples, have proven to make up lost time by reducing and eliminating secondary operations.

AIRCRAFT INSTRUMENTATION

Leading U.S. instrument makers use Hauser Burnishing Machines for much of their super finishing work on small parts. The new Hauser Super Finishing Method with especially developed ceramic wheels has found many suitable and cost-cutting applications in the instrument field.

SWISS MACHINES TO U.S. STANDARD

Hirschmann disregarding additional manufacturing costs, is striving more and more to adapt Swiss machines to U.S. Standards. Most of their machines are not only built to such standards but also are equipped with U.S. fuse boxes, belts, switches and standard precision ball bearings.

AIR SHIPMENTS

In many emergency cases Hirschmann has made delivery of medium sized machine tools (2000 lbs) from Switzerland to Midwestern factories in 48 hours via transatlantic air freight service. Through special assistance by U.S. customs, air shipments are cleared with only a few hours delay in New York.

CAM AND TOOL SERVICE

Complete cam and tool service for Automatics is obtainable directly from Manhasset. Factory trained Hirschmann specialists assure accurate and prompt service.

DIAMOND WHEELS

Hirschmann has secured considerable quantities of diamond wheels, which are adaptable for most standard machines. Prices are somewhat above domestic wheels due to the fact that in Switzerland the diamond market is still operating on free market.

SPARE PARTS

Carried in stock at 30 Park Avenue, Manhasset, N.Y., is most every spare part necessary for Hirschmann machines. Large quantities of collets and carbide tools of every bore and size also are standard stock items.

If you want the complete issue of HIRSCHMANN HIGHLIGHTS regularly, write Carl Hirschmann Co., 30 Park Ave., Manhasset, N. Y.

Manufacture of inflammable products at this plant made

FIRE PROTECTION

a *must* in design

Result: One of the lowest insurance rates in the industry

(Twelfth article in Western Industry's plant construction series)

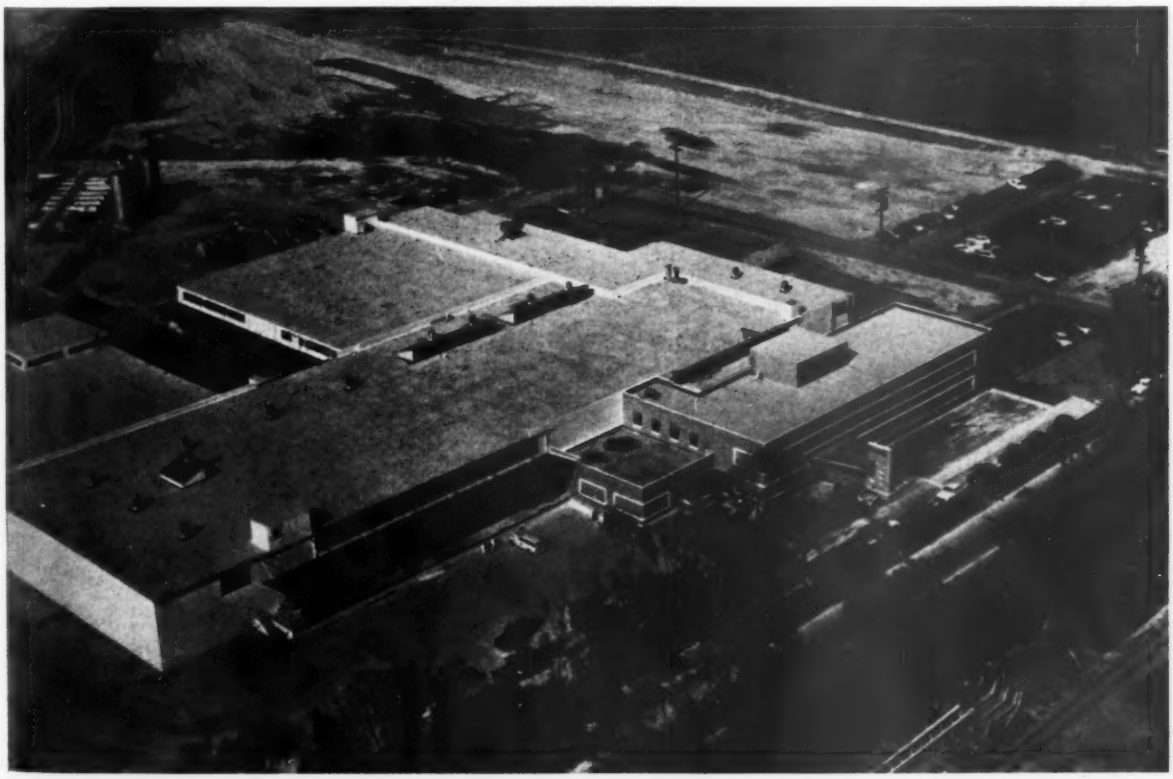


IN most industries processing high fire-hazard materials, acceptable plant design accomplishes something more than mere efficiency in routing and handling provided by a reasonable cost of plant construction.

The yardstick of fire prevention is also applied to the new blue-prints, and final approval is gained only after management is assured that the new structures will play their part in keeping fire insurance rates at a minimum.

Pittsburgh Plate Glass Company's new $1,250,000 paint, varnish, and

AIR VIEW of the new plant. Tanks containing inflammable liquids have come off the roof and are in isolated area away from plant



resins plant in Torrance, California, meets both these requirements. Designed by Albert C. Martin and Associates, and constructed by Mac-Isaac, Menke and Roach, Inc., Los Angeles, general contractors, this plant is earning probably the lowest insurance rates that can be awarded to a paint factory and at the same time be measuring up to its anticipated production performance.

You Can't Burn It

The importance attached to fire prevention in the building of this plant is shown by the fact that non-combustible materials were used so largely that the structures themselves will not add fuel to any fire starting from materials used in the production of paint. A small amount of trim is the only combustible material used in the building.

The 172,000 sq. ft. plant and office buildings were concrete and steel constructed with shear walls and suspended slabs in the manufacturing section.

Also in the interest of fire prevention is the location of the 162,100-gal. inflammable liquid storage tank farm in the rear of the property at a considerable distance from the plant. Thinners and oils from the 10 horizontal 8,000- to 12,000-gal. tanks and four 20,000-gal. vertical tanks are fed into the plant by 5- and 7½-hp. positive displacement pumps located at the tank site.

Tanks Come Off the Roof

These pumps are controlled from the milling and batch assembly sections where the switches must be held open manually for functioning. This safeguard against fire hazard may be compared with the older method of positioning tanks at the roof level to create a gravity flow that could not be isolated in the event of fire.

Underground resin and varnish tanks storage consists of 35 tanks from 8,000 to 12,000 gals. capacity. These tanks are of steel and are equipped with explosion-proof fittings.

The influence of insurance rates upon the design of the Torrance plant may also be noted in the isolation, by fire-resistant walls of varying thicknesses, of areas where the more hazardous operations occur. The erection of a separate building for the handling and storage of nitro-cellulose used in the manufacture of lacquer shows the extent of this influence.

Partitions installed throughout the manufacturing areas are 8, 10, and 12-in. square filler blocks, the heavier blocks being used where fire hazard is more extreme.

A Four-Armed Fighter

Further emphasizing the management's concern for the danger of fire is the presence in the plant of more than double the quantity of fire fighting equipment required by the underwriter. Topping this list is an automatic sprinkler system installed throughout the plant except in weather shelters where there is no storage.

Water supply for this system is taken from the public mains of Torrance. These in turn are fed by a combination of near-by deep wells and from the more distant source of Boul-

. . . Continued on page 52



MAIN FLOOR PAINT manufacturing section. Note piping overhead for the automatic sprinkling system. Sprinkler network is divided into five systems serving five fire-wall protected areas.



LIQUID RAW materials are delivered by electronic control from a tank farm at the rear of the plant. Such tanks were previously placed on the roof where they could not be isolated during fire.

Designing a Plant with Built-in Safety

By ALBERT C. MARTIN, JR.

Albert C. Martin and Associates

THE EXCELLENT results in attaining low insurance rates as well as a sound functional structure, can largely be attributed to the Owner-Underwriter-Architect team. In special problems such as this, only close collaboration can make possible new forms and new arrangements which do not by their very nature violate some of the "rules of the game."

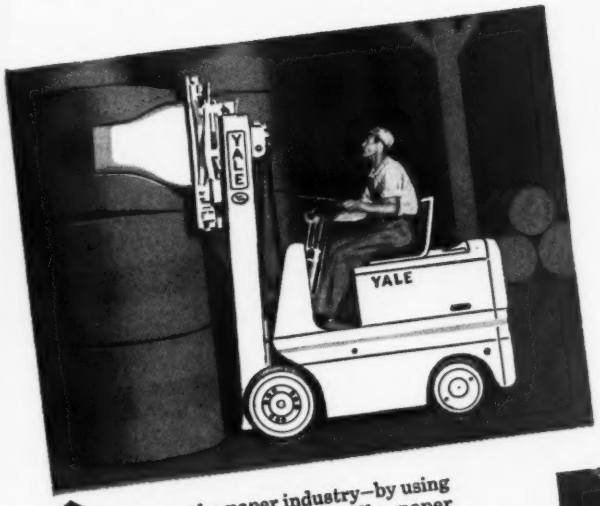
One of our biggest jobs in designing for safety as well as economy, is the pioneer work necessary for an acceptance of such new forms and arrangements by those who will insure the structure. Designing buildings in accordance with the "rule" has its benefits; however, the rules must change as our processes change.

It is for this reason that the designing of material handling plants is now becoming more and more a collaboration between the owner, underwriter, and architect.

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FIRE PROTECTION

. . . begins on page 49

der Dam. A 250,000-gal. water storage tank stands near the plant site as an auxiliary source.

Separation of the sprinkler network into five different systems serving the five protected wall areas is an important feature. A control valve for each riser is located in the yard a safe distance from the exterior wall of the plant. These valves will be used only if the sprinklers fail to operate automatically because they are under repair at the time, or in the event that a fire progresses too far for the sprinklers to be effective and water conservation is desired.

Hourly recorded watchman service is provided for the system on a twenty-four hour basis and all valves are fitted with local alarms.

In extremely hazardous areas where highly combustible material is constantly exposed and in use deluge heads were installed. These must be tripped manually and will be brought into play only if a complete and instantaneous flooding condition is desired.

Four electrical control centers, isolated in non-explosive areas, were constructed off the floor, near the ceiling, with access by ladders. All electrical control centers are equipped with iron-clad switch gear which contain the starter and disconnects. The only starters located in explosive areas are in portable equipment.

LOBBY RECEPTION FOYER (top) is designed for friendly, cozy atmosphere, typical of many new Western plants. Method of lighting by continuous panels of glass block, with vision strips at seeing level, is seen at bottom in employees' lunch room.





Equipment Spark-proofed

All material handling equipment throughout the plant is fitted with spark-proof wheels, and electrical tractors are spark-proofed. Only bronze tools are allowed in use within the lacquer manufacturing areas.

The complete alarm system consists of 11 battery-powered signal stations located in zones corresponding to the sprinkler system zones, a coding station placed in the guard room, and signal horns hung in every section.

Each department has an abundant quota of plainly displayed hand-operated extinquishers and each is loaded with the chemical most recommended for use on combustible materials found nearest each extinguisher. Four fire hoses are positioned exterior to the plant buildings. These are 8-ft. plywood cubes housing a hydrant and 200 ft. of 3-in. hose, two nozzles, and a support rod. One nozzle is the fog type, for use on varnish fires.

Well-trained Fire Brigade

Personnel trained to handle this equipment are organized throughout the plant into extinguisher and fire hose squads. Decision of the management to recruit a well trained fire brigade from plant personnel was based on Pittsburgh's experience in other paint factories.

Also, due to the fact that Southern California is in an earthquake area, it was thought desirable to provide for a situation in which the Torrance fire department might be engaged with numerous calls elsewhere when a fire started in the Pittsburgh plant. And since the employees of the plant have an intimate knowledge of the materials present in each department this would give them an immediate advantage in point of speed in deciding which type of extinguisher to bring to bear on a given blaze. Added to this was the advantage of having sufficient fire fighting equipment right on hand to handle any emergency.

Key personnel in each department are designated as members either of the extinguisher or the fire hose squads and each man is assigned to a specific piece of equipment. Each brigade member is trained in the purpose and use of his own equipment and is thoroughly familiar with its exact location at all times.

Ten pages of clear, simply phrased

. . . continued on page 54



here are some of the interesting questions this book answers about regulators

How do regulators work — what is the difference between a single and a two stage reduction regulator — how does a gauge differ from a flowmeter — why are some regulators hard to adjust — what is a line regulator — what modern safety protection should a good regulator possess — what does the regulator inlet filter do — are big springs and large diameter diaphragms an advantage — how should one order a regulator

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FIRE PROTECTION

. . . begins on page 49

instructions as to procedure during an alarm is required study for every employee. In addition to detailing techniques for handling equipment, making squad assignments, and listing horn signal codes for fire locations the booklet seeks to avoid confusion at alarm time by directing that actual fire-fighting will be "limited to men in the department where fire occurs and those men designated as Extinguisher Squad and Fire Hose Squad."

In the event of an alarm all persons assigned to equipment are instructed to carry the piece to the location of the fire and hold it in readiness for the use of the employees assigned to fight the fire. If a group of sprinkler heads is actuated, the extinguisher squad is instructed to shut the system off at the post indicator valve as soon as the fire is out or under control. Charts showing control points of post indicator valves for the system as well as code signals are prominently displayed around the plant.

This newest of paint factories, one of the West's most modern, and a model of productive efficiency and fire resistance was built, with all equipment installed and piped, by MacIsaac, Menke and Roach, Inc.



SUSPENDED ball and pebble mills eliminated the necessity for multiple-story construction at Pittsburgh's new plant.

BUILDING FEATURES . . .

FLOORS

172,000 square feet area including office and factory buildings. Concrete with exception of Robertson type removable steel decking in mill and mixer room.

WALLS

Six in. gunite and concrete block filler type. Shear walls of poured concrete. Smooth exterior finish. Wood float interior finish. Brick and glass block form exterior of office.

ROOF

Eighteen gauge Holorib steel decks

WHO and WHAT

Architect: Albert C. Martin and Associates, Los Angeles.

General Contractor: MacIsaac, Menke and Roach, Inc., Los Angeles

Subcontractors:

Union Steel Company ..... *Structural Steel*
Soulé Steel Company ..... *Steel Sash, Screens*
A. D. Hoppe ..... *Lath and Plaster*
L. A. Fencing ..... *Fencing and Gates*
W. R. Steyer ..... *Decking Floor, Roof*
Lawrence Steel ..... *Steel Rolling Doors*
R. W. Downer ..... *Armstrong's Cushiontone Acoustical Tile*
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SS 202

throughout with exception of concrete over the varnish cooking area.

FIRE WALLS

Concrete and concrete block or gunite.

DAYLIGHTING

Continuous window arrangement supplemented by some skylighting. All areas in which paint is thinned, tinted or processed have north light.

Office is lighted by continuous panels of glass blocks with vision strips at the seeing level. Special prismatic light-directing blocks are used above eye level to guide the light toward the ceiling and obtain maximum natural daylighting with minimum glare.

Food Processing Anniversary Celebrated

THE TWENTIETH anniversary of the food processing industry in the Blue Mountain district that lies between Lewiston, Idaho, and Pendleton, Oregon, was celebrated at Walla Walla, Washington, the week of April 27 under the direction of the Walla Walla Chamber of Commerce.

This development has transformed southeastern Washington and northeastern Oregon from an area relying principally on a single crop, wheat, to a diversified agricultural-industrial economy.

New Plant Per Year

In 1932 the first cannery produced 32,115 cases of various items, of which 69 cases were peas. In 1952 there were 19 canning and freezing plants and a large can manufacturing plant in the area, producing 6,750,000 cases of canned peas and 60,000,000 pounds of frozen peas. This was the equivalent of 17 per cent of the nation's output of canned peas and about 30 per cent of the frozen peas.

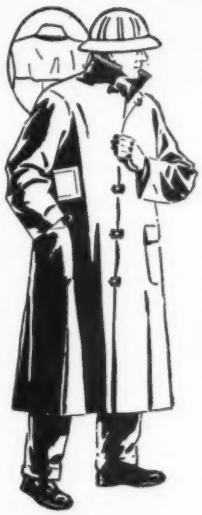
Other products processed are asparagus, spinach and peas-and-carrots, as well as broiler chickens.

Large scale mechanized farming methods developed over the years in producing wheat have been utilized in growing green peas.

Titanium Analysis Medal Awarded

O. A. (BUD) WHEELON, production design engineer of Douglas Aircraft Company, has been awarded the Wright Brothers Medal by the Society of Automotive Engineers for his published analysis of problems involved in using titanium in airplane design and construction.

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Est. 1870

BRAND NEW PRODUCTION MACHINE TOOL

. . . a boon to the sheet metal industry

A BRAND NEW production tool has just been announced, to the joy of sheet metal production plants in the aircraft industry in particular, and to the benefit of the sheet metal industry in general.

It is a brand new type of hydropress that is one-tenth the size of conventional presses, yet capable of exerting up to three times the pressures currently used to form thousands of sheet metal parts used in airplane construction.

Because of its low cost and small size it can be used by small subcontractors to produce many aircraft parts that cannot presently be subcontracted except to major manufacturing establishments.

The higher pressure makes it possible to form the heavier gauge metals employed in modern high speed aircraft and has the additional advantage of reducing hand-forming by some 50 per cent, the Douglas announcement said.

Other Uses Beckon

It is suitable for shallow forming of aluminum and other sheet metals used not only in aircraft but other metal working industries. One future application, Douglas said, will be the hot forming of titanium and magnesium, both coming into use in newer military airplanes.

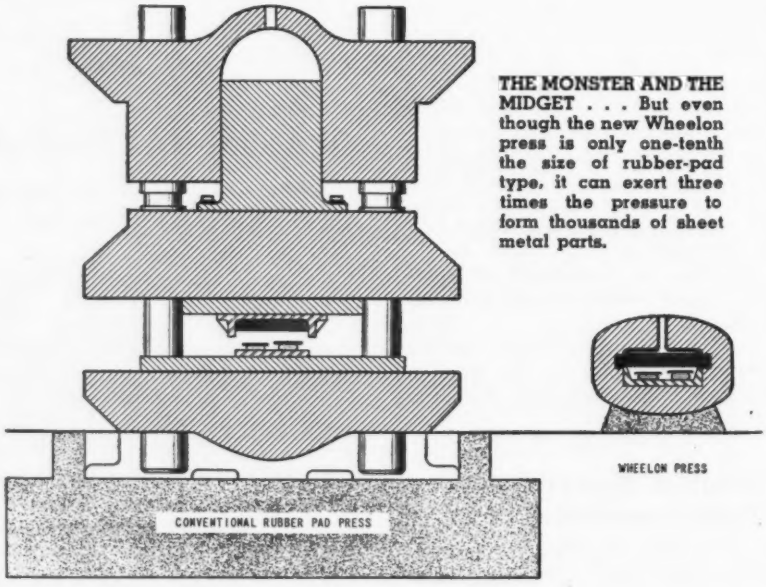
Developed by O. A. Wheelon, production design engineer of the Douglas Santa Monica Division, the new tool is known as the Wheelon Direct Hydraulic Press. It is designed to perform the type of shallow forming currently done on the Guerin-type rubber pad presses. The bulk of metal forming in the airframe industry is done by this process.

The Wheelon Press, however, is a major improvement on the basic principle of the Guerin Process, also developed by Douglas in 1935, and which has been described as the greatest single contributor to the manufacture of the all-metal airplane.

As in the Guerin Process, metal forming on the Wheelon Press involves

ON PAGE 47 of *Western Industry*, March, 1952, there appears an article entitled "New Developments in Rubber Hydropress Forming Reduce Man-Hour Finishing Time 80%." That article is one of many that were secured by *Western Industry*'s Managing Editor during an extensive field trip through all the major aircraft production plants in California. At that time, the information published was the latest available on rubber hydropress forming, and it brought you up to date on the activity.

This particular development, the Wheelon Press, born at Douglas Aircraft Company, Santa Monica, California, was not available for publication at that time, though it was undergoing final testing. It was just released to the press, at the time this issue of *Western Industry* was about to be published.



THE MONSTER AND THE MIDGET . . . But even though the new Wheelon press is only one-tenth the size of rubber-pad type, it can exert three times the pressure to form thousands of sheet metal parts.



OPERATOR'S POSITION at the new Wheelon direct-acting hydraulic press. Operator was dwarfed by the conventional rubber pad press.

a single, male die. Sheet metal blanks are placed over simple, inexpensive form-blocks and pressure is applied by hydraulically inflating a rubber bag or bladder mounted in the immobile roof of the press.

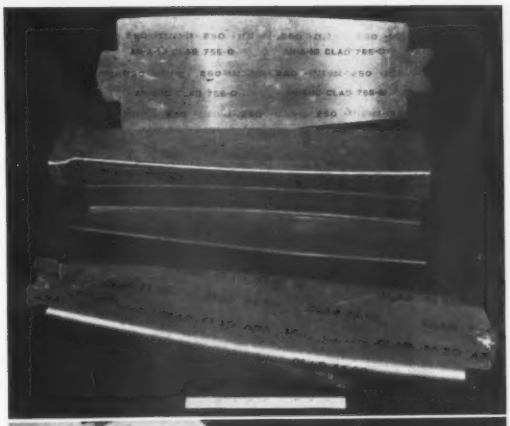
Three Times the Pressure

Unlike the conventional single-acting presses, the Wheelon Press has no moving parts except the bed.

While pressures available with the widely-used Guerin Process usually are in the neighborhood of 1,000 to 2,500 psi. (pounds per square inch), the Wheelon Press permits pressures of 5,000 to 10,000 psi.

The pilot model, used with great success in production at the Douglas Santa Monica plant, operates at 5,000 psi., and applies a total load of 2,500 tons on a bed of 20 by 50 inches. With this press, aluminum sheet in gauges up to one-quarter inch have been formed more perfectly than possible on the huge conventional hydraulic presses which dwarf it in size and cost.

In addition to the superior per-



EXAMPLE of heavy-gauge metal forming on the Wheelon press. Top to bottom: metal blank pre-cut from 1/4-in. 75S aluminum alloy; Kirksite form block; bottom view of part formed by Wheelon press; top view of same part. Small scale in foreground is 10 in. long.



DETAIL CLOSE-UP of heavy-gauge part in the photo above illustrates double break of the flange obtained through effective side pressure obtained by Wheelon press. It is this feature which reduces the amount of hand forming usually required after conventional rubber-pad pressing.

formance of the Wheelon Press, Douglas reports these advantages:

1. Using present dies, handforming has been reduced approximately 50 per cent. With a slight change in form blocks, a still greater reduction is possible.

2. The initial cost of the new press is a fraction of the cost of conventional hydraulic presses, making it practical to make numerous installations in various parts of a plant layout to speed production.

3. Since production of the press, itself, is relatively simple it can be placed in the hands of manufacturers quickly. It uses relatively little steel and no critical materials.

Douglas started studies for a press of the type developed by Wheelon several years ago and the decision to make a prototype was reached early last year. The pilot model was installed in the Santa Monica production department in January of this year.

The Developers

Wheelon said he was assisted materially in his development work by Don Morden, an associate in the production design group; W. D. Mitchell, of the strength group; and L. J. Swiers, outside tooling buyer. Gordon Freeman, mechanical engineer in the Santa Monica plant engineer's office, was responsible for producing the power package for the electrical and hydraulic mechanism. The hydraulic system,



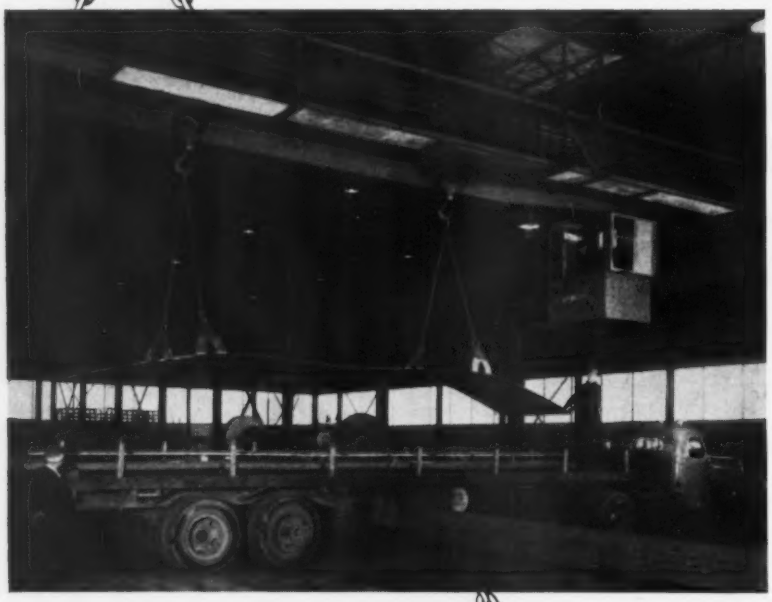
O. A. WHEELON, production design engineer of Douglas Aircraft Co. Santa Monica Division, is developer of the Wheelon Direct Hydraulic Press.

itself, was produced by the Rucker Company, of Oakland, California.

Douglas announced that the Wheelon Press will be manufactured and marketed, under license, by the Verson Allsteel Press Co., of Chicago, Illinois.



Another EDERER crane at work moving steel in Western Industry



When you have materials to move —like this large Western Steel Supplier—you have your particular requirements for a crane. EDERER "job engineers" cranes to any type of industrial use—and can do the same for you. Delivery? When do you need it? That's why this 50-year-old crane manufacturer is now one of the largest on the Pacific Coast. EDERER Crane Bulletin C-300 tells more . . . a note from you will bring it.

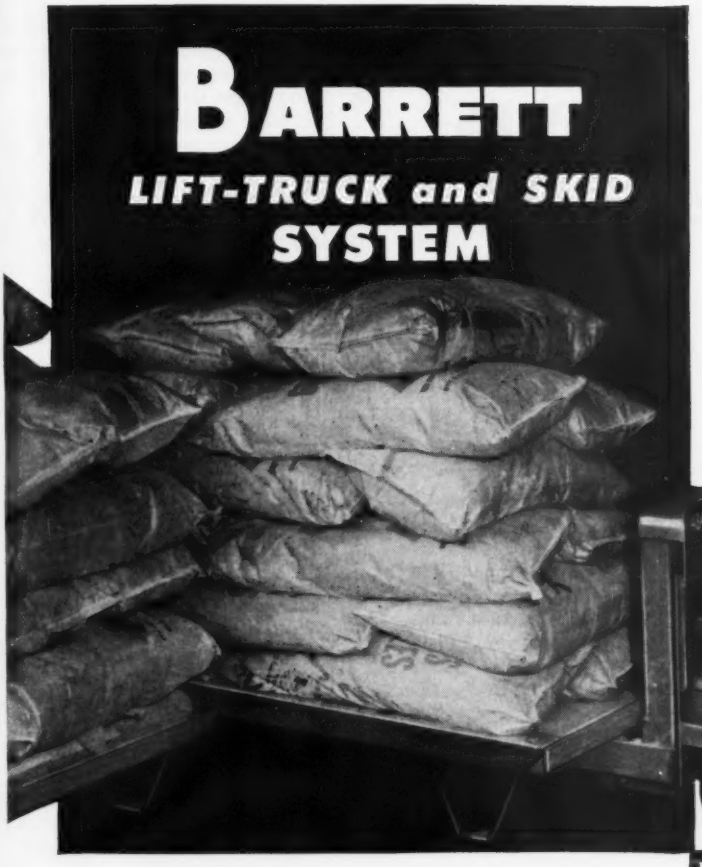
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STEELEG SKIDS. Replaceable hardwood platforms; manganese steel angles. Any width and length. Plain, box-top or stake platform.

SINGLE STROKE HAND LIFT-TRUCKS just run truck under skid and raise with ONE STROKE. Step on release treadle—load lowers gently by hydraulic check. Model J (illustrated) 2500 lb. cap., 17⅜" and 23⅞" wide. Model R, 4000 lb. cap., 17⅜" and 24⅛" wide.



Fork-type Model EX hand-operated Lift-truck for handling pallet loads up to 60" long with easy hydraulic lift.

HOW MANY SAMPLES make a valid test

Statistical methods can be used to make a reliable determination

By ARTHUR HIGHMAN
Senior Statistician
Stanford Research Institute

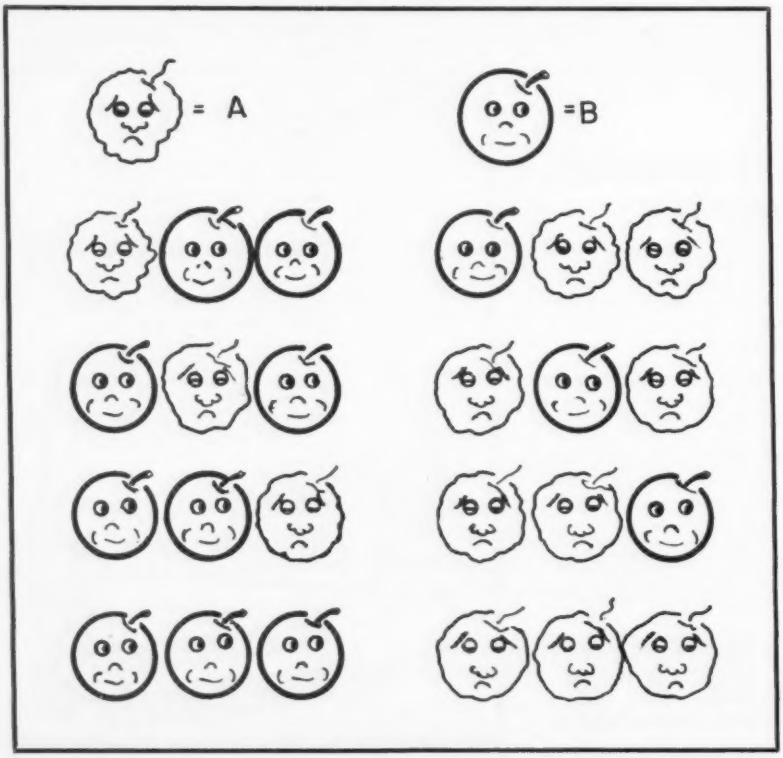
STATISTICAL techniques have now become an important new tool for industry. They are useful not only in planning experimental work and interpreting experimental data, but also in the optimum control of industrial operations.

Research should be planned so as to obtain the maximum amount of information with a minimum of time and cost. A fairly simple and straightforward statistical planning of experiments can achieve this. Results then can be analyzed statistically so as to wring the most out of them and at the same time prevent wrong conclusions.

The right kind and amount of sampling offers an example of the use of statistics to keep work to a minimum both in experimentation and in industrial operations. Suppose one has the problem of determining the breaking strength of filberts as part of a study on the qualities of filberts. The breaking strength will vary from one filbert to another. How many must we test to arrive at an average figure sufficiently representative, and correct enough, for our purpose and yet without testing any more filberts than necessary to get the answer?

This same problem arises in determining the number of samples of smokestack gases that must be analyzed to estimate the amount of an offending chemical being given off to the atmosphere by an industrial plant. In industry, sampling offers similar problems, such as in determining the average analysis of scrap iron going into a steel furnace, or in determining whether a shipment of parts, or talc, or fertilizer meets specifications.

BECAUSE there are eight possible combinations of three, the "triangle" method of testing saves 25% of materials otherwise wasted if combinations of two are used. Why? See the discussion later in this article (pp. 62, 64). The idea is simple, but in research or business it can mean considerable savings in time and money.



No Need to Guess

It is possible to determine statistically the minimum, yet adequate, amount of sampling needed for any desired precision in results. We don't have to guess.

Let us consider another use for statistics. Going back to filberts, suppose we wish to determine whether there is a difference in the breaking strength of one variety as compared with another. How many filberts, selected at random, would make up a valid sample? Let us run a preliminary series of tests on four filberts of each of two varieties. Assume we have the results for the eight filberts as shown:

Filberts

	Breaking Strength—Kgs./Sq. Cm. Variety A	Variety B	Difference
1st filbert tested.....	25	32	—7
2nd filbert tested.....	33	27	+6
3rd filbert tested.....	32	25	+7
4th filbert tested.....	34	28	+6
Average	31	28	+3

Can we, from the average breaking strength of 31 for variety A and 28 for variety B, generalize that A has a higher breaking strength than B? We cannot. Although the values for the second, third and fourth pairs of filberts tested appear definitely to be higher for variety A than for variety B, the opposite is true for the first pair, and with only four pairs tested, the figures are not conclusive.

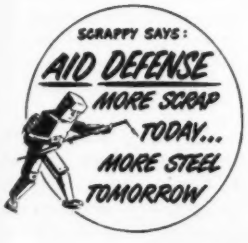
Assume we consider a difference of 3 kgs./sq. cm. (roughly a 10% difference in strength), though not less than this amount, to be important. We can, using a variability concept, by an analysis of the variation from filbert to filbert and between varieties, calculate that an additional eight of each variety must be tested to obtain conclusive evidence for a generalization as to the comparative breaking strengths of A and B.

Let us run a fifth test for each filbert variety. Assume we get the figures of 32 for A and 28 for B. We can now

. . . continued on page 62



Grandpa Never Threw a Thing Away



It's only human to want to hold on to things after they've outlived their usefulness. That's why today millions of tons of worn-out and obsolete equipment and machinery are lying forgotten in the country's plants and factories and on farms.

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Steel Plants: South San Francisco, Los Angeles, Seattle

More Scrap Today... More Steel Tomorrow

HOW MANY SAMPLES?

. . . begins on page 60

review the results of all five of each variety by sequential analysis.

This is a concept developed in detail during World War II. Using sequential analysis, we now find it possible to conclude, as a generality, with only five filberts of each variety tested, that A has a breaking strength greater than B.

It will be noted that the over-all average breaking strength for all ten filberts tested is 29.6 kilograms per square centimeter. Five filberts test higher than this value, and four of these are of variety A; only one of B tests higher than 29.6.

Moreover, it will be noted that the second, third, fourth, and fifth filberts of variety A, a full four in sequence, show a breaking strength of over 29.6 kilograms per square centimeter. The last four, the second, third, fourth and fifth filberts of B, four in a row, show a breaking strength of less than the ten filbert average of 29.6.



ARTHUR HIGHMAN, author of "How Many Samples," is Senior Statistician at Stanford Research Institute, Stanford, Calif.

By referring to calculated tables, it can be ascertained that the probability of such a grouping and sequence, by chance alone, is very small. We can then conclude that A definitely has a higher breaking strength than B—and with results for only five filberts of each variety.

Here we have illustrated both a concept of analyzing variations in individual values in a sample and a concept of analyzing the sequential arrangement of values for testing the significance of experimental results. Both are powerful tools of analysis and both are useful. We use both constantly at the Institute, as for example, in testing whether measured differences in vitamin content between fresh and frozen foods are significant—that is, conclusive—or not.

Less Testing Per Answer

Statistical techniques enable us to design experiments so that the answer sought can be reached with less testing than would otherwise be the case. Let me illustrate.

Assume that Joe says he can tell the difference in flavor between orange juice from two geographic sources, A and B. We can experiment to test Joe on this by presenting two glasses, one filled with A juice and one with B juice.

If Joe picks out which is which, we cannot be sure whether luck or real ability to tell between the two juices was responsible, as the possibilities are 50-50 that the right one would be picked just by chance alone. We want to test Joe in such a way that there is the least possible chance of telling A from B orange juice by merely guessing.

Suppose, then, we repeat with another two glasses of orange juice and ask Joe to pick which is which. Here the odds are again 50% that he would

. . . continued on page 64

BE PREPARED { *To increase production* / *To lower costs*



Photo courtesy Hamilton Mfg. Corp.

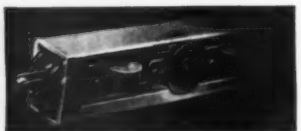
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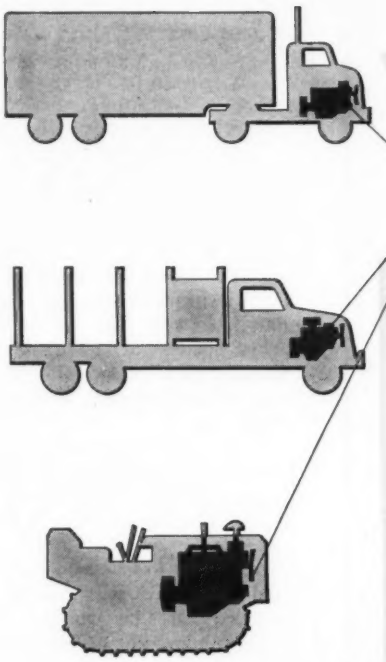
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E. B. Johnson, Freight Traffic Manager
Santa Fe Lines, San Francisco, Calif.

HOW MANY SAMPLES?

. . . begins on page 60

select correctly by chance. The odds are 50% times 50% or still a full 1 in 4 that he would have picked right both times by guess alone. We have already made up four glasses of orange juice, and still cannot be sure but that Joe has been just lucky in his selections.

Suppose we make up three glasses only, one less. Let us squeeze out each glass of juice one at a time, tossing a coin each time to decide whether A or B oranges will be used. Then let us ask Joe which is which among the three glasses. There are now eight possible combinations of three, and the chances of picking all three correctly by guess alone are 1 in 8.

8 Possible Combinations of 3

1.	C	F	F
2.	F	C	F
3.	F	F	C
4.	F	F	F
5.	F	C	C
6.	C	F	C
7.	C	C	F
8.	C	C	C

C equals A orange juice
F equals B orange juice

Thus, with a statistically re-designed experiment, the sensitivity of the test has been increased a full 100%, since odds on guessing have gone from 1 in 4 to 1 in 8. Yet only three glasses of juice have been squeezed out instead of four. In research or in business, this represents money saved.

At Stanford Research Institute, we make use of this design of experiment in taste-testing. In the development of a food-roasting process, it has been necessary as we go along to test for taste quality to be sure we are on the right track. Testing is done by the so-called "triangle" method.

The philosophy of experiments in the past often has been to hold all conditions constant except for the single one being studied. Testing a number of conditions or factors or components in a formulation, one at a time, can run into a lot of work and money.

This would be true, for example, in testing the effects of a wide range of materials in various proportions, plus factors such as cooking temperatures and time, in the development of a varnish or paint formulation. The same would be true for cleanser compounds or for lubricating oil formulas.

Through what we call statistical factorial design, it is possible to reduce considerably the amount of work involved in judging the effect of various factors. Experiments are planned in

which a number of different factors are all varied at the same time. The effect of each factor is then wrung out of the resulting figures, statistically, with pencil and paper, using a technique known as analysis of variance.

Factorial design may be useful in the analytical laboratory, as for example, in studying with a minimum of work the effect of variations in pressures of air, oxygen, and fuel gas—three factors each at several values—on the determination of potassium by flame photometry.

Suppose a petroleum company wishes to know how good a sales job on gasoline it is doing in a particular district as compared with the job being done by the company in its other districts. To make comparisons, we need to take into consideration differences in sales potential among districts.

This means we must have a method for estimating potential. Let's suppose that sales per registered motor vehicle depend on per capita income; on the density of population, which is one measure of the differences between urban and rural populations; and on road mileage.

Let's get together company sales figures for all districts and tabulate them. In some cases, industry figures (if available) may be better, but company figures can be used. By working backwards from the figures, it is possible through what we call multiple regression analysis to determine the relationship between our three factors and sales.

Annual Gasoline Sales in Company's Districts

Gallons Per Registered Motor Vehicle

District	Gasoline Sales	Income Per Capita $100s	Population Per Sq. Mi.	Roads—1000s of Miles
A	70	10	10	62
B	89	13	14	73
C	99	15	18	81
D	107	17	23	100
Etc.	Etc.	Etc.	Etc.	Etc.

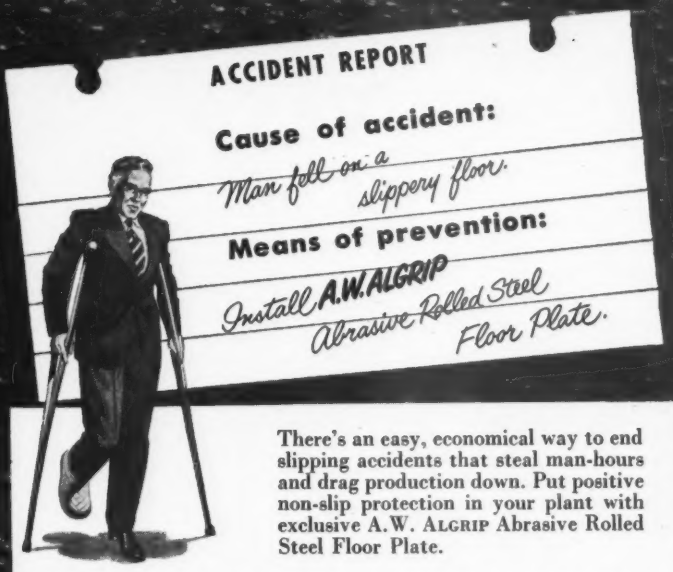
For the figures in the table the relationship is:

$$\text{Gasoline Sales} = 9 \times \text{Income} - 2 \times \text{Pop.} + 0 \times \text{Road Mileage}$$

Sales are highly correlated with income; they are negatively correlated with population density, despite what superficially appears to be the opposite in the table. Again, there is no relationship between sales and road mileage despite the appearance of a positive correlation.

With a formula, based on the *actual* and the *average* company performance in all of its districts, it is possible to set up a realistic standard for measuring performance in any specific district.

HOW MUCH ARE SLIPPING ACCIDENTS COSTING YOU?



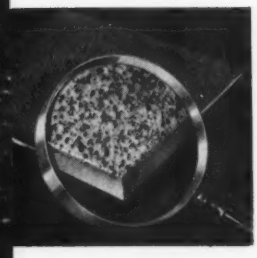
There's an easy, economical way to end slipping accidents that steal man-hours and drag production down. Put positive non-slip protection in your plant with exclusive A.W. ALGRIP Abrasive Rolled Steel Floor Plate.

NON-SLIP—EVEN ON STEEP INCLINES!



ALGRIP is made by rolling tough abrasive grain (the same kind used in grinding wheels) *uniformly* as an integral part of the steel plate's upper portion. When you walk on ALGRIP, hundreds of tiny safety brakes grip your feet at every step. *Result:* It's virtually impossible to slip—even on steep inclines.

WEAR WON'T WEAR OUT ITS SAFETY!



ALGRIP's safety isn't merely a surface treatment. Note the even distribution *and* depth of the abrasive grain. As the surface wears, new particles are exposed, so ALGRIP keeps its non-slip qualities for a lifetime. It needs no maintenance. Rolled steel makes it stronger than other abrasive floorings. It withstands hard blows and heavy loads without cracking or breaking. And thinner sections can be used without reducing load carrying capacity.

Get Full Details of ALGRIP Today

Our new Booklet A-6 gives complete technical details suggests uses. Write for your free copy. *It may save you countless hours and dollars!*



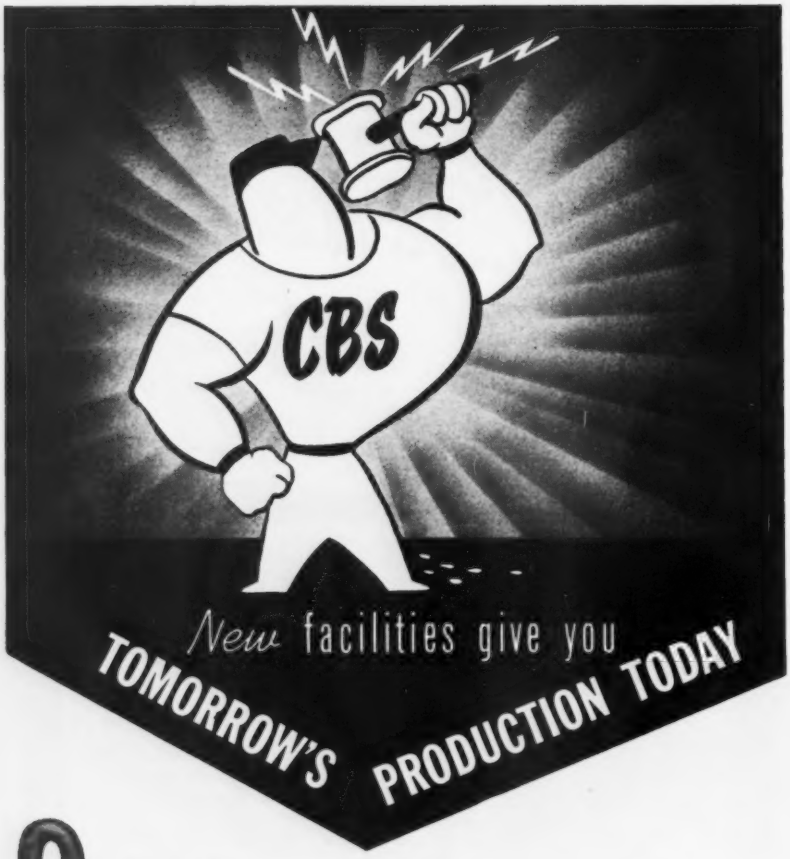
A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALAN WOOD STEEL COMPANY

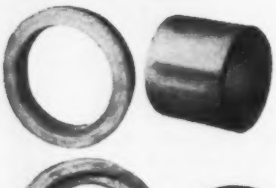
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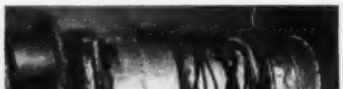
Device Solves Wire Rope Handling Problem

A SPOOL OF WIRE ROPE weighing up to 14 tons presents a problem if it must be moved in a hurry to fill a will-call order. The situation is further complicated by the fact that when a large stock is maintained, many huge reels must be stored close together. Ordinarily, many of them would not be immediately accessible.

That problem has been solved however at the Los Angeles warehouse of the Republic Supply Company of California, which maintains a large stock of Edwards Wire Rope and a rigging service.

By an ingenious arrangement of blocks and pulleys, activated by a company-made winding machine, rope is drawn off otherwise inaccessible reels and around intervening objects without moving any of them.

Confronted with the problem of speeding up delivery of this hard-to-handle product, the Manufacturing Division of Republic Supply devised a series of heavy staples set into the floor at strategic intervals and below the floor level. To these, snatch blocks are hooked as required by the location of the wire rope reel needed. Several blocks are often required to by-pass intervening reels.



From the spool and through these blocks, the rope is drawn through a counting machine on the floor by a special winding machine, designed and made in the firm's manufacturing division. On this machine a delivery spool is placed on a horizontal spindle where it engages a finger which fits into a hole on the delivery spool flange to furnish leverage for winding. Power is applied and the operator reels off the required length of rope for delivery within a matter of minutes.

The great saving of delivery time by this ingenious system has enabled the wire rope and rigging department to give the same rapid service as with other types of merchandise in the Los Angeles warehouse, where a will-call order is handled every 4½ minutes on the average and where the average delivery time is a record ten minutes.

HERE'S THE *Payload Story* OF THE YEAR



TODAY'S truck operating conditions call for *more* payload . . . *more* power—the *extra* earning power advantages engineered into this entirely *new* kind of truck—the White 3000.

It carries much more payload within legal limits because of its new weight distribution and shorter wheelbase. And White has the power for every load and road condition. Year-after-year operating economy is another White quality advantage.

Look into this PAYLOAD story of the year for your business. It's today's way to extra profits . . . extra earning power.

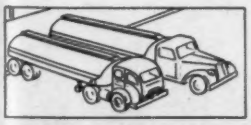
THE WHITE MOTOR COMPANY • ***Cleveland 1, Ohio***

GENERAL PETROLEUM CORPORATION, a Flying Red Horse company serving the West, likes payload advantages of this White Model 3026T with 6300 gallon tank trailer. Outstanding maneuverability saves delivery time.



FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

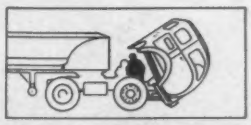
IN EVERY FEATURE . . . TOMORROW'S TRUCK TODAY



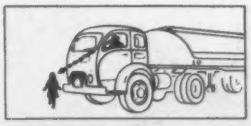
MORE PAYLOAD because of new weight distribution, shorter wheelbase. Takes less space on street and on the job.



DRIVER saves time at every turn . . . at every stop. Low, curb-level cab saves steps and saves energy.



COMPLETE front-end accessibility because of power-lift cab. Savings of 25% or more in maintenance made possible.



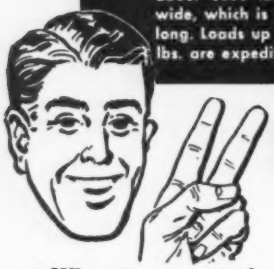
SAFER, BETTER to drive because of wide-angle visibility. New cab comfort, driving ease, faster acceleration.



In only five minutes waiting time this truck is loaded and ready to go. This load weighing about 8000 lbs. was preassembled. It is 6'-0" wide, which is standard for all trucks, and 22'-0" long. Loads up to 5000 ft. weighing about 10,000 lbs. are expedited in this manner.



A great deal of time is saved when placing lumber into the balcony storage. Here is shown a 5000-lb. load of 8" x 12'-0" planks hoisted onto a portable platform which extends from one balcony to the other. Once on the platform the load is easily pushed to either side by means of rollers.



SAVES TWO HOURS TRUCK TIME ON EVERY LOAD

• When it comes to handling lumber, a lesson in efficiency can be learned at the Henrich Lumber Co., Inc., Buffalo, N.Y. A 5-ton Cleveland Tramrail push-button-operated hoist carrier, operating on a single arch beam track extending the length of their warehouse, picks up a complete load of lumber and sets it on a truck in a few minutes. By customary hand handling it formerly took more than two hours to do this job.

Obviously, the less time that is required to load a truck, the more time it can be in operation on the road delivering lumber. Saving two hours on every truckload permits a truck to haul much more per day than usual. This can eliminate the necessity of buying additional trucks should business increase otherwise require it.

Another advantage especially appreciated by Henrich is the quick delivery that is made possible. As soon as an order is phoned in, work can be started on making it up. By the time a truck arrives the order can be completely assembled and tied together with steel banding, ready for lifting onto the truck. Thus, deliveries are often made many hours sooner and customer goodwill enhanced.

The same Tramrail equipment saves much time in handling lumber to the mezzanine storage. Formerly boards were placed there one by one. Now large loads are lifted onto a platform and then rolled to one side or the other where men can quickly handle them into the proper storage sections. The platform is portable and moved about with the Tramrail carrier.



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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Spiral Chutes Originate in the West

SPIRAL CHUTES are a Western invention, a review by Ferry Steel Products and Equipment Company of San Francisco of its early history reveals. Back in 1903, when such devices had never been heard of, Haslett Warehouse Company had to find some answer to the problem of speeding up merchandise handling in multiple story warehouses.

Together Charles Cormack, Haslett's general manager, and Henry David Stirm designed a spiral chute eight feet in diameter, which is still in operation. Stirm was one of the two founders of a young firm just starting operations, known as the Ferry Sheet Metal Works.

So promising did the new chute look that the Haslett Spiral Chute and Conveyor Company was formed and a factory built in Pennsylvania to manufacture them. The Ferry concern continued as fabricator in the West, and one of its latest jobs is 17 spiral chutes, each one equivalent to a six-story building in height, in the bulk storage plant of the California Almond Growers Exchange in Sacramento. Manufacturing various items, the company is now operated by two sons of Henry David Stirm, who are celebrating the beginning of the fiftieth year of the firm.



FROM LEFT: Edward B. Stirm; Peter Peutz, plant superintendent; Tom Pottinger, firm's oldest employee in point of service (38 years); and H. Glenn Stirm. The Stirm brothers are managing partners.

Tin Can Salvage in S. F.

HOUSEWIVES in San Francisco are being asked to save tin cans for use in Nevada copper production. Tin from shredded cans is used to precipitate copper from seepage water pumped from mines. According to Robert Warner, DPA-NPA salvage chief, five lb. of tin cans save four lb. of copper.

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Coast industrial conference starts to germinate slowly

OUT OF a Pacific Coast industrial development conference, the first of its kind, held in Seattle March 26, is due to come eventually a closer coordination between the three states in matters of common industrial interest. Apparently it will be something of gradual growth, unless some crisis should precipitate the necessity for immediate cooperation.

Announced as a joint meeting of the industrial plant location committees of Oregon, Washington and California, the conference drew a large attendance, and there was considerable inconclusive discussion of economic topics such as fuel and power, and of the necessity for interstate cooperation. This left most people rather baffled, and inclined to speculate as to why the meeting had been called.

Origin Obvious

Actually it seems to have grown out of an earlier feeling that some joint action might be necessary in order to head off efforts of other sections of the country to lure away industry from the West, under guise of the necessity of safeguarding against atomic attack. There were some fears then that much of Boeing's activity might be transferred to the Middle West and out of it grew a logical plan for industrial plant dispersal promoted by the Seattle Chamber of Commerce.

This industrial dispersal program was taken up by the government and given widespread publicity, meeting favorable reception everywhere as it did not constitute a regional threat. Nevertheless the potential danger of other threats to the West seemed to make a coast-wide meeting advisable, and the Seattle conference resulted.

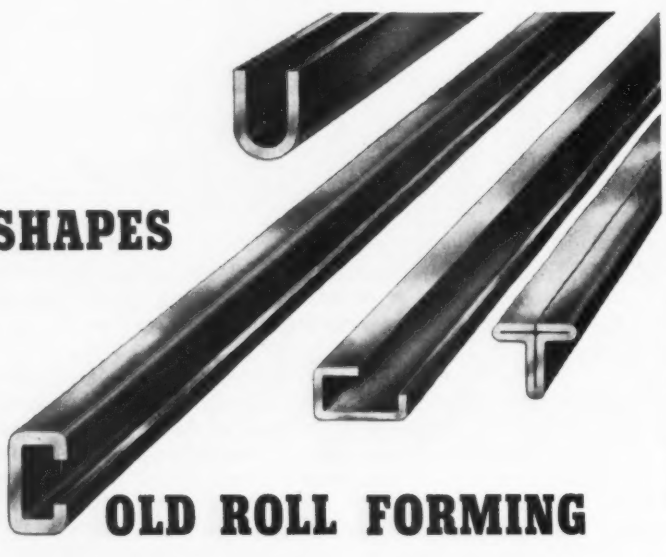
Good Turnout

California is the only state of the three where a functioning plant location committee exists. It is an adjunct of the California State Chamber of Commerce, and for several years has been holding periodic meetings where current industrial matters are reported on and informally discussed. While not spectacular, its operations are regarded as distinctly helpful.

Dean E. T. Grether of the School of Business Administration, University of California, Berkeley, is its chairman, and George N. Hawley, assistant to the president, Southern California Edison Company, is vice-chairman. Dean Grether presided at the Seattle meeting, and a good-sized delegation accompanied him from California.

Washington recently had a committee set up on paper, with Dean Austin Grimshaw of the College of Business Administration, University of Washington, as chairman. It was well represented at the meeting. Governor Langlie also recently appointed an industrial development committee, but no reports have yet been received as to its activity.

For Oregon, Dean Victor Morris of the School of Business Administration, University of Oregon, is chairman of a new industrial plant location committee, but for activity in that state the palm must be handed to the Oregon Committee for Industrial Development. This organization, chairmanned by Sid Woodbury of Portland, has been in existence for perhaps a year,



SHAPES

COLD ROLL FORMING

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and has been doing a highly effective job much after the order of California's industrial plant location committee.

Usual Fears

Previous to the Seattle meeting, there seemed to be some alarm in other Western states that they were being shut out of something, but until a coast-wide linkage gets under way there need be no fear that other states are missing anything.

Within Oregon and Washington much suspicion and jealousy seems to be rampant, reminiscent of earlier days in California before the State Chamber of Commerce provided channels where such feelings could be dissipated.

Whether an attempt will be made to hold another coast-wide meeting soon is doubtful, unless it is on some quiet and informal basis. The latter method seems to be favored.

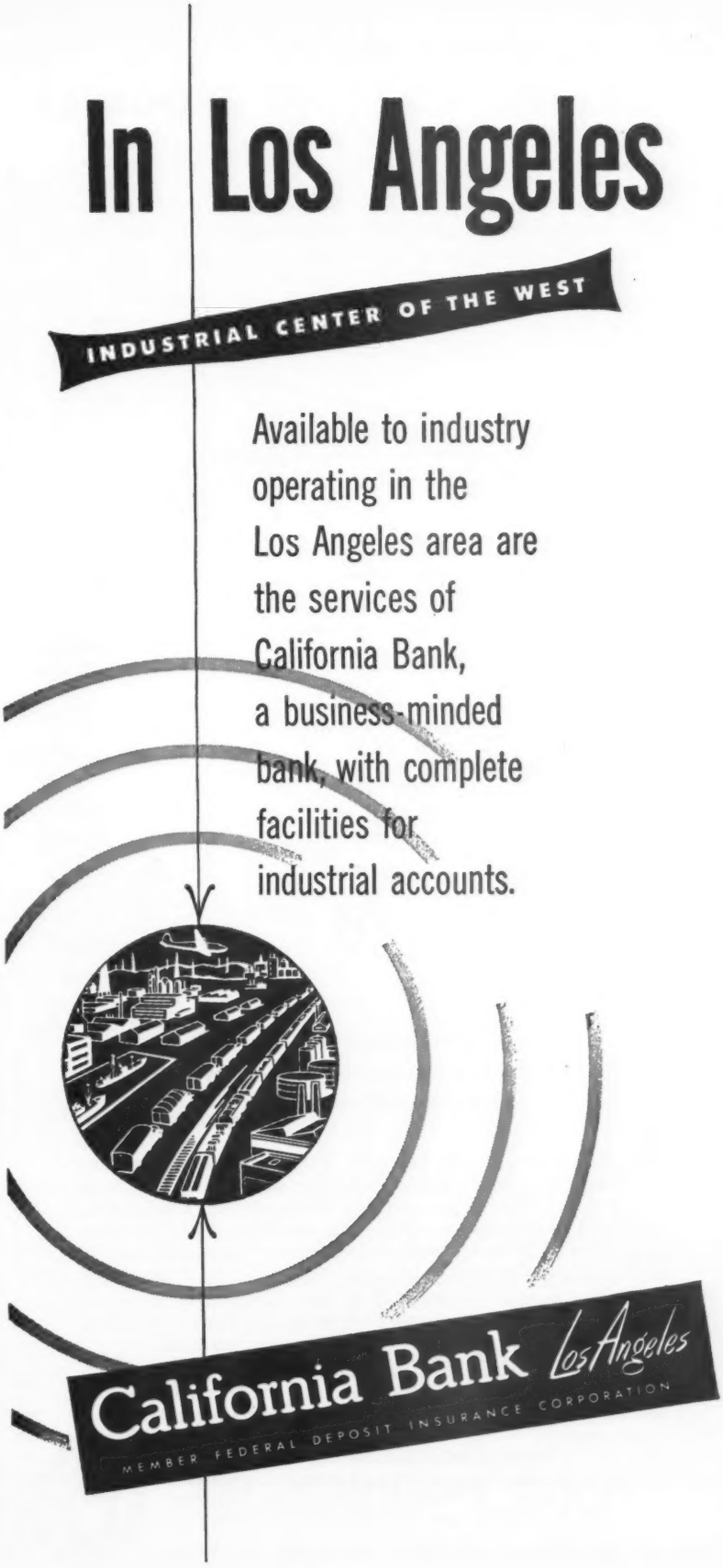
Executive Development Seminars Instituted

A PRACTICAL-LEVEL FULL-LENGTH SERIES of management seminars for executive development to be held on the Pacific Coast, patterned in considerable measure after those at the Harvard Graduate School of Business, has been instituted by the School of Management, Golden Gate College, San Francisco.

It begins May 20, and consists of two afternoon sessions weekly for a period of 13 weeks. Each group will be limited to 20 persons, and the fee for the course is $145. The program was designed by and will be led by practicing and practical business executives.

Included in topics to be discussed at the seminars are: "Requirements for Executive Success," "Personal Development," "Coordinating Human Effort" and "Challenges and Opportunities Facing Business Management."

These discussions will be led by such executives as Alexander Heron; Frank Beckmann, president of Beckmann Hollister and Co.; Frank P. Foisie, labor-management consultant; James E. Holbrook, vice president of Pabco Products, Inc.; Walter H. Kassebohm, plant manager, Marchant Calculating Machine Co.; Dr. William P. Shepard, vice president, Metropolitan Life Insurance Co.; William H. Smith, director of research, San Francisco Employers Council; A. B. Tichenor, vice president, Matson Navigation Co., and Stuart P. Walsh, director, Industrial Survey Associates.



California companies combine for . . .

CERAMIC COATING PROGRESS

APPLICATION of ceramic coating on aircraft parts is here to stay, apparently, and growing about as fast as the aircraft industry itself in its infant days. Ryan Aeronautical Co., San Diego, and California Metal Enameling Co. have just combined their activities in this field, after two years of coordinated production and testing of ceramic coated parts for high-temperature aircraft applications.

In announcing this merger of ceramics programs, these two firms also announced that an improved ceramic, A-418-Ryanco-C had been developed as a result of lab and service tests, and that it had been in use for some time in production of aircraft engine components.

This new agreement provides that both companies will jointly finance a continuing program of research in the improvement of high temperature ceramic coatings and their application.

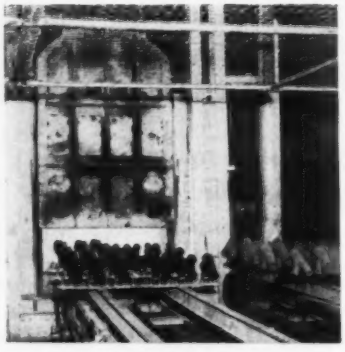
Not only do the ceramic applications extend the service life of alloys specified for jet and internal combustion engine components, but they also give lower grade alloys the rugged stamina required.

For example, many vital high temperature components for jet engines, which are made of Inconel, may now be fabricated from Type 321 stainless steel and adapted to the same applications with ceramic coatings. Since Inconel contains a minimum of 70 per cent nickel and Type 321 contains only between eight and 11 per cent of the precious metal, a substantial saving of this scarce material can be thus effected.

Similarly, other critically short elements such as Columbium, cobalt, and tungsten, may be conserved by substituting lower grade alloys coated with this ceramic.



DIPPING METHOD of applying ceramic coatings insures complete coverage of both interior and exterior surfaces.



BOX-TYPE FURNACE at California Metal Enameling Co., where ceramic-coated exhaust sections are being removed after firing at 1,850 deg. F.

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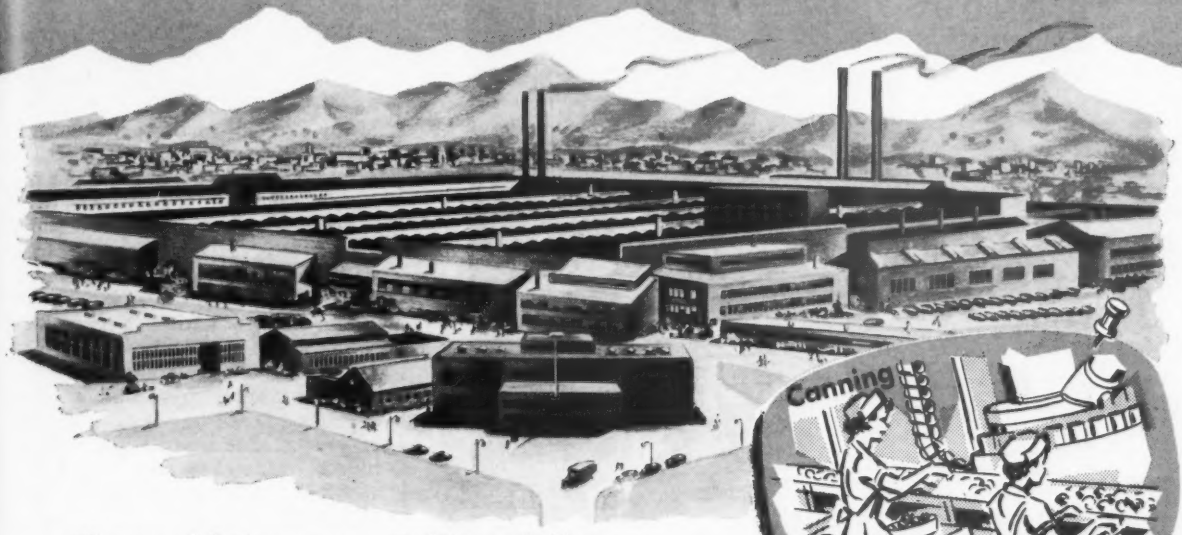
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NEW stretch-flattening MACHINES

may have wide applications

FOR EVERY JOY, there is a corresponding pain—even in the aircraft industry, it seems. For example, our newest aircraft are high-speed and highly-stressed, and they demand thinner wings and stronger parts. Engineers who design these aircraft have been considering the use of integrally stiffened skin structures to offset some of the structural problems, reduce weight and volume requirements, and add strength.

End result of various types of experimentation to provide such a structural fabricating metal is the appearance of a tubular extrusion, with the integral stiffeners radiating from the outside periphery of the tube. These tubular sections then have to be split and flattened into sheet form—and here is the fabricator's pain. It is a critical problem.

Many and diverse internal stresses accruing from the complex configuration of the extruded integrally stiffened section defied all efforts to produce a sheet within the flatness tolerance requirements for precision airframe construction.

Longren Aircraft Co., Torrance,

PREVIEW . . .
of things to come

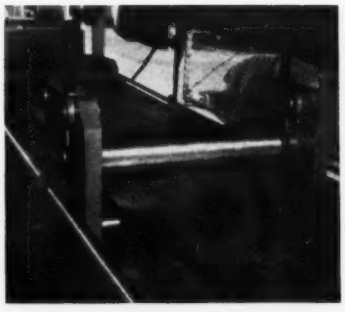
MANY INDUSTRIES are likely to benefit from this new development, though it came about in the aircraft manufacturing research process and it is announced merely as a new machine to do an immediate job.

For example, with the production of greater quantities of aluminum, and aluminum extrusions such as this machine processes, and with the eventual cutting down of aircraft production, we can see potential uses of this development to supply panels for use in building construction, truck beds, freight car bodies, etc.

Once you set your mind to work on possible uses for this innovation, the limit is determined only by your imagination and experience.



AFTER HEAT TREAT and before rolling and stretching. That piece of curved metal was once half of a long extruded tube.



ROLL STRETCH flattening in action. This machine will flatten that half-tube within precise tolerances, and do it quickly.

Calif., announces a remedy in the completion of a new and revolutionary (patent pending) stretch-flattening machine that can process in volume these integrally-stiffened extruded sections with flatness tolerances well within the current requirements.

When the aluminum alloy integrally-stiffened extruded tubular sections are received in the Longren shops, they are first split longitudinally, roughly flattened, then heat treated.

In the flattening, the heat-treated integrally-stiffened sections are end-mounted between mechanical V-clamps in the tension-flattening machine. One of the V-clamps remains fixed while the other is mounted on a hydraulic piston. Using hydraulic pressure, the entire sheet is then placed under tension to a point just below the yield strength of the material.

After this initial tensioning, the traveling carriage with its three rigidly mounted displacement rolls is started along the sheet from the stationary jaw end. The movable chuck automatically takes up the slack of elongation and maintains even tension.

Lower rolls of the carriage are sectional in design so that the tops of the extruded stiffeners rest firmly against an inner roll, while the outer rolls press firmly against the sheet area between the stiffeners. The upper roll is solid and smooth, and presses against what will be the external side of the flattened section.

As the traveling carriage progresses along the sheet, the material feeds over the first lower roll, then angles slightly downward under the upper center roll. Beyond the upper center roll, it angles upward again, then reverts to the plane of tension between the end clamping jaws after leaving the last displacement roll.

It is quite obvious that just as the material passes under the center roll, the greatest elongation takes place. At this point, the material is tensioned slightly beyond its yield point, and work hardening takes place. On passing the last displacement roll, the material stabilizes to a permanently flattened condition.

To further assure this passive condition, the angles of displacement through the rolls are carefully balanced out, thus assuring equal stress relief in both the sheet and the extruded stiffeners. After the sheets have been flattened to permissible tolerances, they can be contoured.



Air engineering *is* expensive when the equipment used does not fit the requirements of the job. A fan or blower too large to be economical, or too small to be efficient, wastes money.

We show only three of the wide range of Master Fans, available in every size and type, with designs that can also be engineered to suit unusual conditions in your particular plant. Built to exacting specifications, with guaranteed performance ratings, Master Fans combine accurate balance and quiet performance with rugged, heavy duty construction.

Whether your need is for heating, ventilating, air conditioning or exhaust equipment, there IS a Master Fan for every job. Call or write for complete information.

MASTER FAN CORP. **VAndyke 1037**

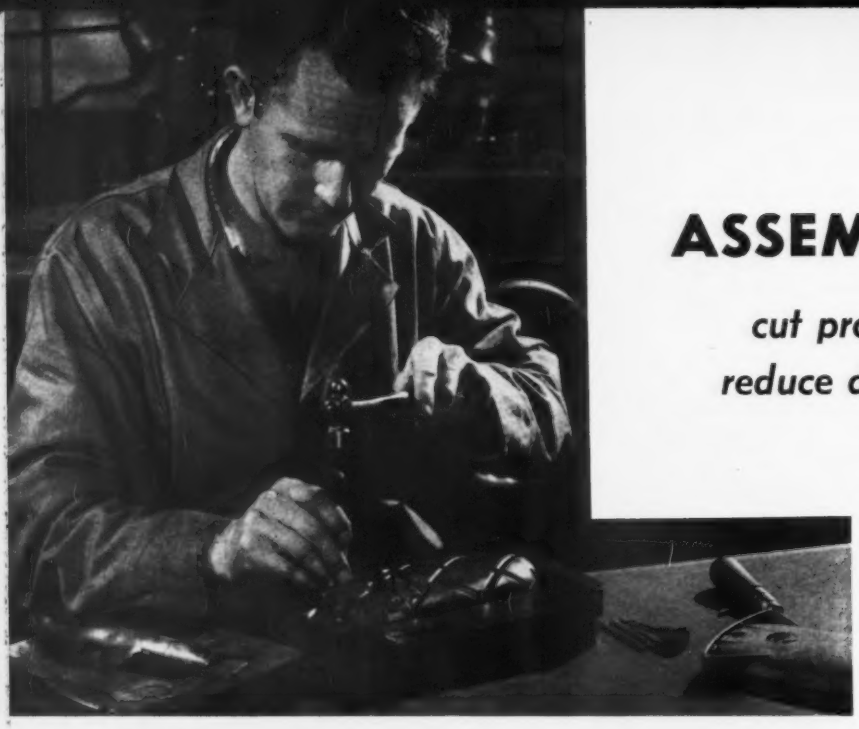
FAN MASTER CORP. T.M.

To:
Master Fan Corp.
1323 Channing St.
Los Angeles 21, Calif.

I am interested in:
☐ Blowers and Exhausters
☐ Air Washers
☐ Dust Collectors

NAME _____
FIRM _____
ADDRESS _____

☐ Mail literature
☐ Mail technical data
☐ Have representative call



ASSEMBLED DIES

cut production costs, reduce die replacements

Gasoline motors manufactured cheaper and faster by this novel combination of engineering principles

IN THE PROCESS of becoming one of the largest American firms die casting magnesium alloys, McCulloch Motors Corp. of Los Angeles has developed an unusual method of fabricating top-quality steel tooling at an exceptionally low cost.

This company's need for magnesium die castings became apparent after the end of World War II, when it was decided to mass-produce portable chain saws, for which gasoline engine components of extreme light weight were essential.

Then company engineers discovered they had a tooling problem. It was necessary either to fabricate first-quality tooling at a lower cost than conventional casting dies, or to pass along relatively high tooling costs to the buyers of portable chain saws—an operating procedure that can be guaranteed 100% to minimize the market for any product.

The Process

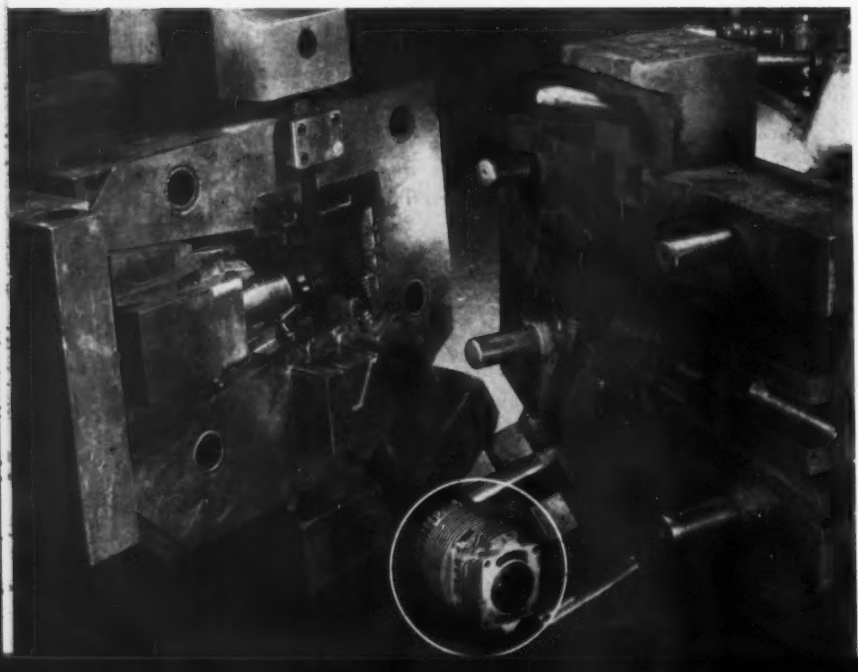
According to normal conventional procedure, when steel casting dies become worn or damaged or obsolete because of product model changes, the entire dies are discarded or salvaged. Logically, then, McCulloch engineers pondered the question: "Why can't we make our dies as assemblies with individual parts that can be used and reused, if they are not damaged?"

So they worked out a standardized tooling process based on the use of:

1. Die blocks or bodies, each having the details required to mount a die on a given press platen and a rectangular aperture on its center section.

Purpose of the hole in each block is to provide an area in which cavity details can be assembled—all of which means that the block can serve as a basic component of molds for an almost unlimited number and variety of production runs without being refabricated, heat-treated, etc.

Incidentally, die blocks alone have



TOP OF PAGE—Steel cavity components are readied for assembly with die blocks in the production of low-cost tooling at McCulloch Motors Corp., Los Angeles.

MATED MOLD assemblies of the types now used by McCulloch in die-casting cylinders for air-cooled engines. A cylinder made with these tools is circled.

You should be in

WESTERN INDUSTRY's

PACKAGING & MATERIALS HANDLING ISSUE

The August issue is timed to tie in with the Western Packaging & Materials Handling Conference and Exposition, Los Angeles, August 12-14.

Western Industry's **brass-tack editorial on materials handling and packaging will assure you an unusually receptive audience and timely circumstances for your advertising.**



Regular Rates Apply

Remember, you get this big bonus interest at *Western Industry's* regular rates. Write, wire or airmail your space reservations NOW.



Final forms close July 18... reserve your space *NOW!*

MERCHANDISING BONUS FOR ADVERTISERS WHO EXHIBIT AT THE SHOW!

Four tearsheets of your advertisement in the August issue will be mounted on attractive 11" x 14" display cards to help you merchandise products on display. Ask your nearest *Western Industry* representative to go over the details with you.

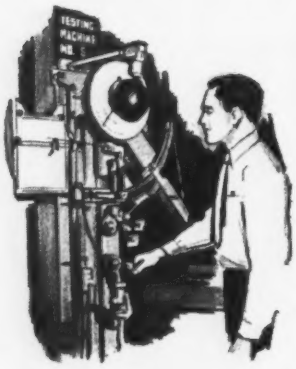


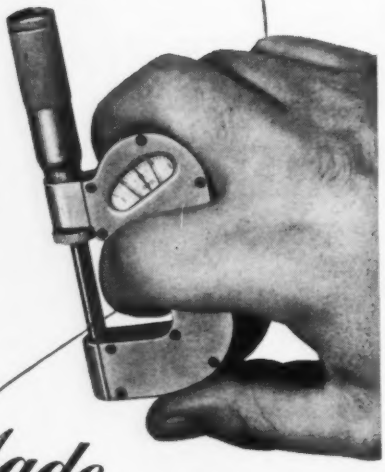
WESTERN INDUSTRY

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JOHNSON

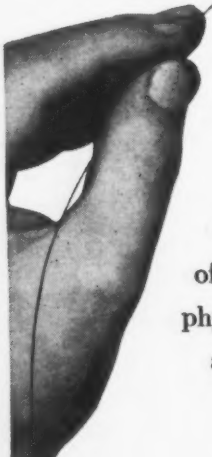


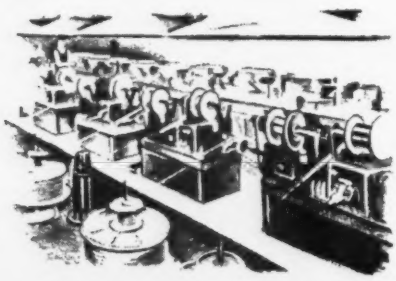


Custom-Made

Specialty Wires

A quarter of century of progress —new and better ways to produce custom-made specialty wires, wires of absolute uniformity of prescribed physical and metallurgical properties and drawn exactly to the size which best meets your requirements.





"Johnson Sets the Standard of the Industry"

JOHNSON

JOHNSON STEEL and WIRE CO., INC.

Worcester 1, Massachusetts

SUBSIDIARY OF PITTSBURGH STEEL COMPANY

reduced the material and fabrication costs of many molds by margins ranging to more than 50%.

2. Die cavities, each comprising one or several machined steel parts with details required to fabricate a given part when it is assembled with a die block.

Fairly simple cavities are often machined without the aid of patterns, since experience has proved that a good toolmaker can turn out an acceptable mold cavity in such circumstances about as quickly as a usable pattern can be fabricated. Wood patterns are sometimes specified in machining the more complex cavities, but even this practice has been eliminated where it was possible to fabricate a cavity as a sequence of comparatively simple parts.

For example, an accompanying illustration shows how template-like steel parts have been mated for use as intricate cavities for the die-casting of cylinders with integral cooling fins.

3. Ejector pins, bolts, clamps, and other parts or assemblies of the types that are essential to the production use of any die-casting mold.

Single and Multiple Cavity

Both single and multiple cavity tools have been made and assembled in accordance with the general principles that have been explained in this article. Multi-cavity molds are speci-



TEMPLATE-LIKE STEEL STRIPS are readied for the assembly of a die-casting mold which will be used in the production of cylinders with integral cooling fins.

fied on the basis of dimensional practicability, but never for the simultaneous production of two or more different articles with a single machine because few (if any) dissimilar parts are required by McCulloch in identical quantities.

Tolerances for critical dimensions in the various die assemblies range from about .010 in. to .001 in., plus or minus, and tooling details in other respects are designed in conformity with the same general considerations that would be observed in the development of any mold for die-casting.

New lab in the West for testing industrial uses of the atom

INDUSTRIAL USES of atomic and nuclear science will become available to industry very shortly here in the West—in the nation's only lab designed and built for the purpose—when Stanford Research Institute opens its new Radiation Engineering Laboratory.

Arrangements have been completed for obtaining a 5,000-curie source of Cobalt 60, a gamma ray emitter, from Brookhaven National Laboratory. Emissions from this source are so powerfully penetrating that they could be partly duplicated only by about $100,000,000 worth of radium. SRI's radioactive source will be five times the power of any presently available for industrial and medical research.

Some of the promising uses to be investigated at an early date include non-destructive testing of metal castings and parts by radiography and the cold sterilization of heat-sensitive foods and drugs.

Need for Zinc Processing Plants

THERE IS A REAL NEED for construction of processing plants between the zinc mines of California and Nevada and the West Coast fabricating plants to avoid the 1,500 to 2,000-mile haul now involved in getting zinc from these mines to West Coast consumers, according to S. S. Arentz, manager of Combined Metals Reduction Co., Salt Lake City.

Speaking at the annual meeting of the American Zinc Institute, he said the high cost of transportation had seriously handicapped zinc mining in these states.

"It is not uncommon for transportation charges to exceed the total cost of mining and milling the complex zinc ores of this area, and the rapid increase in freight rates in the last six years has been a major deterrent to expansion of zinc production in Nevada.

"A factor that will affect future zinc production from Nevada and California is the large increase in population on the Pacific Coast and the sizable fabricating industry that has developed to serve this area. An annual production of between 50,000 and 100,000 tons of zinc a year is possible."

Plastic Industry Spurred On By Metal Shortages

ALTHOUGH plastic materials for such applications as tubing, piping and fittings were utilized originally to compensate for metal shortages, they are becoming more and more popular because of their efficiency, low cost, flexibility and resistance to corrosion, according to Robert L. Temple, industrial sales manager for Republic Supply Co. of Calif.

For example, extruded and comparatively inexpensive plastic piping is being installed instead of stainless steel to overcome corrosion.

Flexible plastic tubing is proving to be a more than adequate substitute for metal in many applications because of its adaptability under high bursting and working pressures, insulating qualities, resistance to corrosive attack by most chemicals, and ease of handling, splicing and installing. Applications include: coolant lines of cutting machines; safety guard air lines; centrifugal pump water lines; compressed air lines; lubricating systems in automotive equipment; lubricating systems in milling machines and gas lines into homes.

"Standardized on NORGREN for years... Extremely Satisfactory"

NATIONAL ELECTRIC WELDING MACHINES CO.

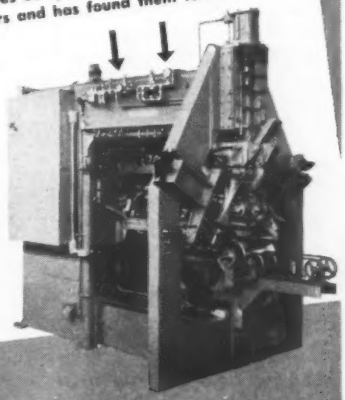
PLANT REPORT

PROBLEM:
To find standard lubricating, air pressure regulating, and air line filtering equipment which would be readily available in sizes and types for easy make up into various assemblies for a wide range of specially designed production-line resistance welders.

SOLUTION:
Use of Norgren Lubricators, Regulators, and Filters.

RESULTS:
"National Electric Welding Machines Company has standardized on Norgren air accessories for years and has found them to be extremely satisfactory.

This special 200 KVA Seam Welder automatically roll-forms, sizes, feeds and mash-seam-welds metal containers from 15" to 25" dia. and 10" to 30" long. This is a typical National Electric Welding Machine Company product, using Norgren lubricators, air line filters and air pressure regulators. Primary air pressure ranges from 80 to 100 psi; secondary from 60 to 80 psi.





- VALVES
- FILTERS
- REGULATORS
- HOSE ASSEMBLIES

Manufacturers of Quality Pneumatic Products for 25 Years

Norgren

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(Suburb of Denver)
Gentlemen: Please send me your free Norgren Blueprint No. 115, giving complete data on above lubrication system.

NAME_____
ADDRESS_____
COMPANY_____

HELPFUL LITERATURE

for the plant operator who wants to keep informed

501

About valves for aircraft

Now available is a 40-page, 2-color catalog of needle, glove, ball check, relief and plug valves, formerly manufactured by *Parker Appliance Co.*, and now produced by *Republic Manufacturing Co.* for industrial and aircraft users.

502

Roto-Flex shaft seal bulletin

Edward L. Parsons Co. offers our readers a folder describing *Gits Bros. Mfg. Co.'s* Roto-Flex shaft seals for use in water, oil, coolant and hydraulic pumps, water circulators, compressors, speed reducers, and many other types of equipment.

503

Cord and cable data

Bronco Certified cord and cable, its characteristics and uses, is subject of a new booklet published by *Western Insulated Wire Co.* Specifications and applications illustrated should be of general interest to plant and factory men.

504

Pump pointers

Tuthill Pump Co. offers our readers a handy check chart to help in selection of proper pump for individual requirements. Six models are illustrated and described and complete specifications are included.

505

Hints on metal hose

Bellows and flexible metal hose, produced by *Flexonics Corp.*, are graphically described in a bulletin published by that firm. Size, range, and fitting attachments are among the subjects covered.

506

Sander and grinder info

Max Manufacturing Co. makes available a folder on its line of 2-in. sanders and grinders. Utility features and specifications are listed.

507

Stories on self-sticking products

Everyone from design engineers to plant foremen should find helpful information in a 50-page full-line product catalog published by *W. H. Brady Co.* on its self-sticking industrial products. Various illustrations and photographs show how these products help reduce cost, save time and speed production.

508

Complete, up-to-date info on water conditioning

Now available to practicing engineers and those who work with water conditioning problems is a 116-page, information-packed water conditioning data book, published by *The Permutit Co.* This volume supersedes an earlier edition and contains a compilation of 77 up-to-date and completely revised tables, all valuable to engineers. Subjects covered include hydraulics, boiler feedwater makeup requirements, impurities in water, chemical conversions, saturated steam, chemicals used in water treatment, alkalinity relationships, specific gravities and chemical reactions. This 5 x 7¼-in. book has a handsome leatherette cover.

509

Fundamentals of measurement and control outlined for industry

"Fundamentals of Instrumentation for the Industries" is title of a 126-page book published by *Minneapolis-Honeywell Regulator Co.*, which covers basic principles of measurement, control and transmission of variables encountered in industry. Typical applications are discussed. Book is divided into such sections as Remote Transmission of Measurements, Types of Automatic Controllers, Power Units and Final Control Elements, and Measurement of Process Variables, all of which should be extremely helpful to industry.

510

Learn about regulators with this helpful literature

National Welding Equipment Co. is offering a 44-page brochure designed to give industry a clear-cut picture of regulators, how they work, and upon what basis of performance of specifications they should be purchased. Here are dependable facts for regulator buyers.

511

What you should know about surface grinding

Knowing your grinding machine and how to get the best service out of it is theme of an 88-page booklet published by *Norton Company* entitled "The ABC's of Surface Grinding." Valuable hints on grinding know-how, wheel selection and various types of grinding machines are compiled here for users and purchasers of this type of equipment.

512

All about the Lewis-Shepard Spacemaster

In an attractive 19-page brochure, *Lewis-Shepard Products, Inc.*, tells the story of its new electric fork truck for motor freight terminals. In addition to an outline of basic design features for this equipment, literature piece also touches on growth of the motor freight industry, and fork truck maintenance costs.

513

Water cooler calculations

General Electric Co. has prepared a booklet describing how proper placement of water coolers can save payroll dollars by cutting wasted man-hours. Bulletin emphasizes employee morale and health benefits.

514

On industrial heating problems

Both management and technical departments will be interested in a 16-page brochure which is packed full of valuable reference material on industrial heating problems. It will be especially useful for selection of heating equipment. Published by *Jensen Specialties, Inc.*

515

Cartoning and wrapping machine catalog

Information on 35 types of automatic cartoning and wrapping machines, and all kinds of ingenious special packaging attachments is now available in a 32-page illustrated catalog just issued by *F. B. Redington Co.*

516

"The Dependable Diesel"

Many stories of Cummins diesels at work in various industries in different sections of the country are contained in current issue of *"The Dependable Diesel,"* published by *Cummins Engine Co., Inc.*

517

Variable-area flow meter handbook

A 40-page handbook has just been published by *Fischer & Porter Co.* to aid in selection and sizing of variable-area meters. This illustrated brochure contains, in condensed form, results of fifteen years' research by the company. A complete description of variable-area meters, tubes, floats and their

comparison with variable-head meters, as well as calibration prediction data has been included.

518

West Coast lumbermen's directory

The 1952 edition of "Where to Buy," membership directory of the *West Coast Lumbermen's Association,* is now available. This 48-page census of Pacific Coast sawmill operators gives all pertinent details of each of the 297 operations named. Information covers capacity, facilities, species and lumber items manufactured, as well as a growing list of lumber by-products.

519

Air conditioning manual

Anemostat Corp. of America publishes a 64-page selection manual which contains technical data for simplifying choice of proper air diffusers in air conditioning systems which should prove very helpful for those concerned with purchase of this type of equipment.

520

Info for sludge pump users

A bulletin describing and giving engineering data and specifications on three basic models of plunger-type sludge pumps is obtainable from *Ralph B. Carter Co.*

521

Crane trolley literature

Checo type "7300" crane trolley, developed by *Crane Hoist Engineering Corp.,* to make available an economical trolley for general industrial use, is described in a new folder published by that company.

522

Transportation cost analysis

A new booklet published by *Fruehauf Trailer Co.,* entitled "Transportation Cost Analysis" tells you how to save money and yet have greater hauling flexibility in your business.

523

For equipment operation savings

"How to Save Money on Equipment Operation" is title of a new booklet by *Standard Oil Co. of California.* Send for your copy today.

524

New booklet tells all about plastigels

Preparation, properties and uses of a new formulation of Vinylite dispersion resins known as plastigels are described in a booklet published by *Bakelite Co., Division of Union Car-*

▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ *Reader Service*

WESTERN INDUSTRY
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Organization.....

CLIP and MAIL a COUPON

for your FREE COPIES of **HELPFUL LITERATURE**

or for more information on **NEW MATERIALS AND EQUIPMENT**

described in the following pages. Also, coupon may be used to obtain complete information on products advertised in this issue.

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Your Water Treatment Problem

and how to handle it

A booklet covering the essentials of water analysis, filtration, softening, scale removal, cost reduction by recirculation, cooling tower efficiency.

Plus

a tabulation of water analyses for hundreds of cities in the eleven Western States.

This is a reprint of a series of articles which appeared in *Western Industry* in 1950-1951. The tabulation of water analyses is the only thing of its kind available anywhere.

Single copies . . 50¢ each
25 copies up . . 30¢ each
50 copies up . . 20¢ each

Available from

WESTERN INDUSTRY

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San Francisco 5
California

bide and Carbon Corp. Technical data on these putty-like substances, which can be processed at room temperatures with low pressures and yet retain their shape to the smallest detail, is presented in this 16-page brochure. Text is devoted to advantages of use, production benefits, techniques of gelling organic liquids, preparation of plastigels and a bibliography of articles which have been published on this subject. Photographs and graphs are also included.

525

Directory of Colorado manufacturers

Just published by *Bureau of Business Research of University of Colorado,* in cooperation with *Colorado Development Council,* is the 1952 Directory of Colorado Manufacturers. Book is divided into three sections: an industrial classification listing manufacturers by major industry groups, products and locale, an alphabetical list of manufacturers and their geographic locations; and an alphabetical list of manufactured products.

526

All about milli-second delay blasting

A 20-page manual describing eight methods of blasting in quarries with milli-second delays is published by *Atlas Powder Co.* Booklet contains previously unpublished machine-gun photographs and methods of shooting to illustrate both progressive and alternate milli-second delay techniques. Also included: discussions on principles of this type of blasting, diagrams of eight delay detonation patterns, and a series of photographs showing alternate and progressive blasts.

527

A look at Placer County

A brief presentation of the industrial and economic potential of Placer County (California), based on a survey made by *Industrial Survey Associates* of that county's Chamber of Commerce is now available. Brochure contains a description of topography, climate, population, agriculture, manufacturing, mining and minerals, transportation and communities.

528

A wealth of information on conveyors and elevators

Book No. 2475, published by *Link-Belt Co.,* should be useful to engineers, purchasing agents and works managers concerned with mechanical handling of bulk flowable materials. This 28-page brochure about Link-Belt's Bulk-Flo conveyors and elevators describes a wide variety of applications for this equipment and contains typical layout drawings, engineering data, calculation tables, charts and formulas. Over 150 materials are analyzed for average weight and such characteristics as size, flowability and abrasiveness.

529

Learn about lava

M. Kirchberger & Co., Inc., issues a booklet, entitled "Lava for Industry," which gives a chemical description of this material from which are manufactured bobbins, spools, threaded heating cores, insulators, pilot tips and gas outlets. Discussed are such subjects as lava's advantages, versatile uses; electrical, mechanical and physical properties.

530

Guidance for users of 4-rope bucket trolleys

To provide assistance for engineers and users of overhead or bridge type cranes with 4-rope bucket trolleys, *Blaw-Knox Co.* publishes a 44-page bulletin containing helpful information and diagrams on its line of 4-rope buckets. This materials handling helper is free upon request.

531

Specifications and prices for 1,000 carbide cutting tools

Wendt-Sonis Co. is now offering catalog No. 52, consisting of 72 pages devoted to specifications and prices for more than 1,000 carbide cutting tools, manufactured by this firm. Also included is a carbide manufacturers' grade recommendations chart.

532

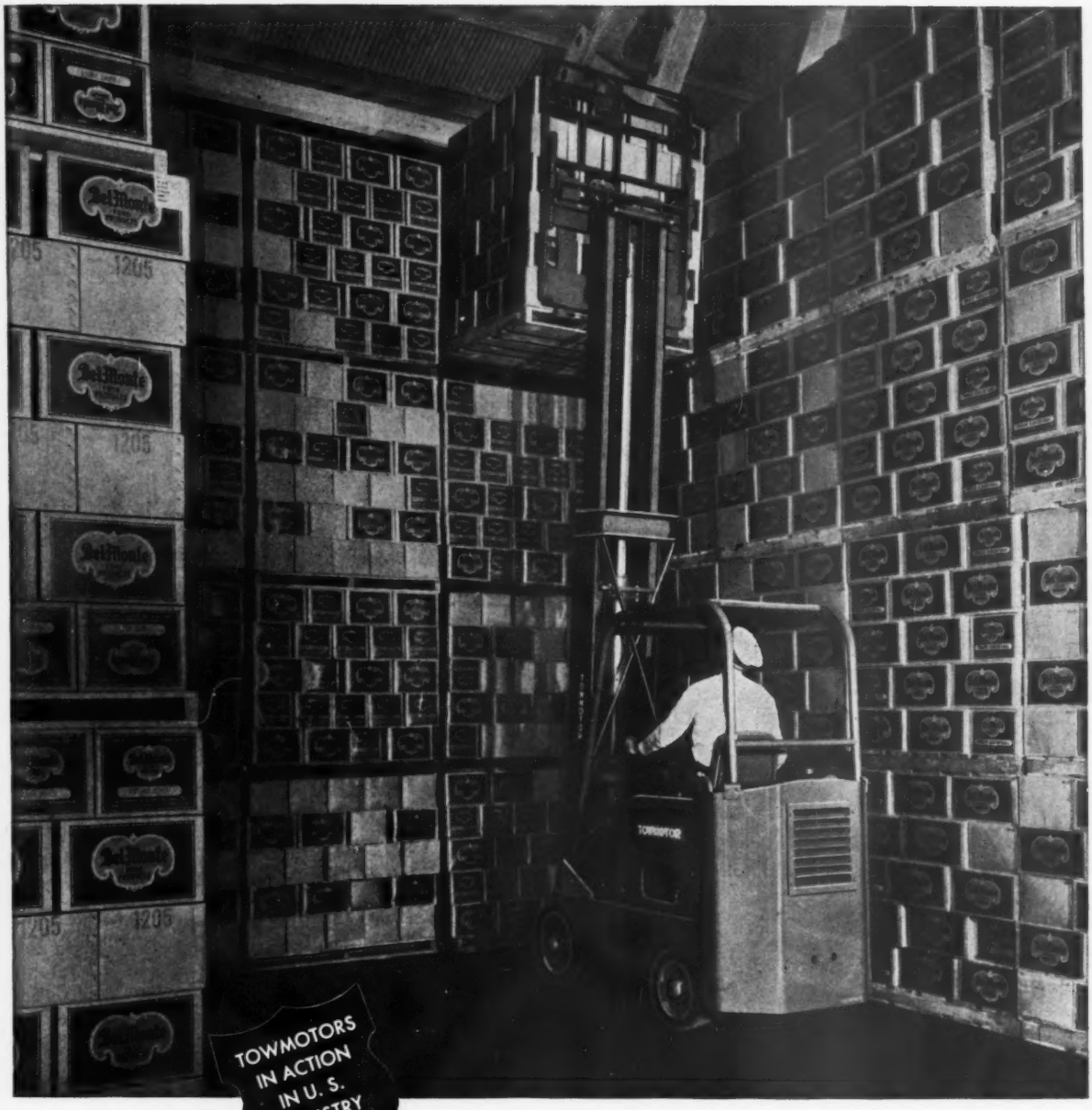
News about anti-rust paints

An application bulletin containing information on selection and use of anti-rust paints for all metal surfaces is now obtainable from *Paint Corp. of America.* Folder discusses various methods of using these paints in industrial, farm, home and marine applications.

533

Tucson-Pima County Base Book

Published jointly by Tucson, Ariz., City-County Planning Department and Bureau of Business Research, University of Arizona, is an economic outline of this attractive Western area. Such section headings as Bank Debits, Electric Customers, Gas Customers, Mining Production, Newspaper Circulation, Postal Receipts, and so on, give readers a clear cut financial picture of Tucson and surrounding area.



Stacking cases four tiers high at Alaska Packers, Alameda, California

Stack Twice As High . . . store twice as much, do it in half the time with Towmotor fork lift trucks. Towmotor handles *all* types of material. For the name of your nearest Towmotor Representative and a TOWMOTOR SAFETY KIT—a portfolio of safety tips and colorful plant safety posters—write Towmotor Corporation, Div. 67, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

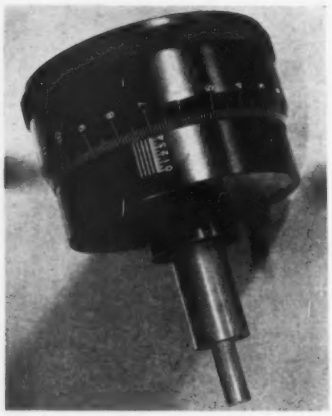
NEW MATERIALS & EQUIPMENT

COUPON ON PAGE 81 provides an easy way to obtain more information on products introduced.



535—It's in the bag (for sure)

Richardson Scale Co.'s self-locking cam-grip bag holder can make your bag-filling operations a cinch. This bag suspension equipment, designed for filling bags of 50, 80 or 100 lb. capacity with bulk commodities, consists of bag-holding mechanism mounted on a spout which can be bolted to hopper or bin outlet. Positive grip during filling is assured, and bag is easily released and dropped on to conveyor or skid by pushing up on a semi-circular release bar. Cast iron spout is secured to hopper or bin outlet by forming a flange at outlet, and then bolting top of cam-grip spout to this flange.



536—Only the head turns

This micrometer head with a non-rotating spindle reads in tenths and by vernier to fractions of tenths. Designed for mounting to any mechanical device where accurate measurement or control is needed. Made by *Boeckeler Instrument Co.*



537—High speed disc grinder

This lightweight, high-speed disc grinder, requiring use of only one hand, efficiently grinds, sharpens and shapes all metals, wood, plastics and ceramics. Speed is 8,000 rpm. Made by *Balmer Corp.*



538—Reaching new heights

Here is an electrically operated "Hi-Lift" telescopic tower, produced by *Atlas Industrial Corp.*, which is especially suitable for cleaning and maintenance work in high, out of reach places. High-Lift starts as a six-ft. tower and can be expanded to 30 ft. in less than five minutes. It is easily handled through door and elevator openings. All four legs have roller bearing swivel casters for easy maneuvering in tight places. Equipped with riggers for extra stability.

539—Bolts by the yard

Ideal for repair, installation and construction work is a line of precision-threaded steel rods which come in straight 36-in. lengths. Made of strong cold-drawn steel with rust-proof coating. Any length bolt is made quickly by hacksawing to size and fitting with standard nuts. Odd-shaped bolts are easily made by heating rod with blow torch. Manufactured by *Redi-Bolt* in six different diameters.

540

Exact milling for small parts

A table-model vertical milling machine especially designed for serial milling of grooves, slits, slashings, joint-seats, etc., is now in stock at *Carl Hirschmann Co.*, U. S. representative for *Technica, A. G.*, of Switzerland. The new machine should be of particular interest to instrument makers and firms making a wide variety of apparatus requiring exact and clean workmanship on small parts.

541

Noises and vibrations spotted electronically

The "Electro-Probe" incorporates a sensitive vibration pick-up and 3-stage amplifier, complete with speaker and headphones to provide audible comparison of vibration sounds within range of 60 decibels. A calibrated meter provides visual indication. Here's a means for systematic checking of running motors and machines to detect and diagnose trouble before failure occurs. Can be used for locating leaks and stoppages in fluid piping systems, inspecting parts and sub-assemblies, etc. A product of *Erwood, Inc.*

542

Corrosion-resistant tubing from Geon 404

Tubing, bar stock, rods and piping made from rigid unplasticized Geon 404 polyvinyl chloride can be sawed, drilled, formed, embossed, turned, threaded, welded, ground, milled and rolled to make valves, pipe fittings, trays, tanks, etc., with outstanding chemical resistance to acids, alcohol and alkalies. Tests indicate more than 2,000 psi. are needed to burst 1¼-in. pipe made from Geon 404. Product of *Van Dorn Iron Works Co.*, the piping comes in ½ to 2-in. sizes, with ¼-in. walls.

543

V-belt sheaves that won't rust or corrode

Providing an extremely hard wearing surface that is unaffected by moisture or oil, these new V-belt molded sheaves are made of Compolene, a new type of fibrous material which is molded to close tolerances under high pressure. Molded gears of this same material have proved to wear better and run much quieter than their metal counterparts. Available in ½-in. sizes from 2 to 6-in. O.D., from *W. C. Products, Inc.*

544

Electricity takes scale out of water

The "Hydrotron" process eliminates scale in heat exchange equipment by changing water electro-physically, crystallizing out minerals. The process is suitable for either fresh or salt water. Need for water softener or chemicals, where mineral scale forms due to hard water, is eliminated. Entire apparatus is small, simple and easily attached. Process has been used with success in Great Britain. Merchandised by *Heller Laboratories.*

545

High-speed, low-budget copying machine

The "Copyflex Model 30" is engineered to make copies for engineers, draftsmen and businesses with moderate print requirements. The machine has a 46-in. printing width to handle 42-in. roll stock or for insertion of multiple cut sheets of copying paper. It can be plugged into any 230-volt, 60-cycle AC power line, and only five minutes instruction make the operator an expert. Suggested uses are for reproducing engineering drawings and tracings, and in accounting and business offices, for copying large size records, balance sheets, charts and cumulative statistical statements. Available from *Charles Bruning Co.*



"Wrapping paper, bags and string—
Where to buy? Here's just the thing!"



"Check your Classified, then call
A dealer who'll supply them all."

Practically all your business needs—products or services—are listed in the Yellow Pages of your Telephone Directory. Classified is your handy guide to local people who sell or serve. So when you need supplies or professional help, find them fast in the Yellow Pages. Just as other buyers will find you fast when you advertise in Classified.

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REDUCE LIGHTING COSTS

Champion Lamps cost less than any other lamps of equal quality . . . and give you maximum light for every cent of current consumed.

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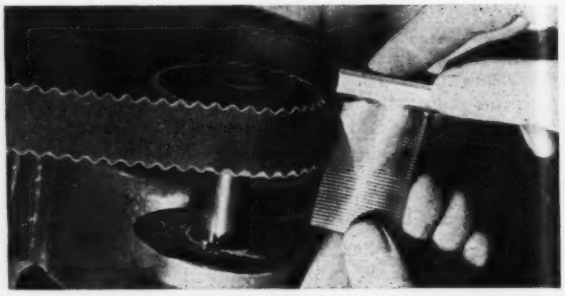
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568 1st Ave. So. Seattle 4 Phone: MUtual 2554

BRANCHES & DISTRIBUTORS IN KEY WESTERN CITIES

546

Serrated-edge grinding belt



The new "Scallop-Edge" abrasive belt was first designed for the automatic precision grinding and finishing of jet turbine and compressor blades in a single operation. Now, it is finding other applications in the metalworking industry—in the manufacture of hand tools, cutlery and other operations involving small-radius grinding and filleting previously done by hand. In use, the scallops of the belt curve around the edges of the contact wheel, allowing fillet areas to be polished on the edge-contour of the wheel. A product of *Minnesota Mining and Manufacturing Co.*

547

Machine for slicing foam rubber

A machine, designed by *Campbell Machinery Development Co.*, for dealers in foam rubber products, will split large rolls or slabs of foam rubber materials as thin as one-eighth of an inch. With this machine in his shop a dealer may now buy foam rubber stock in rolls and slabs and split

There's a MORCK Paint Brush For every production or maintenance job

Hundreds of Industrial Plants use Morck exclusively



Morck Brushes are not just of the run of the mill variety . . . they are designed to meet specific needs. Built to high standards of workmanship, Morck has earned an enviable reputation for nearly half a century in industrial plants and from professional painters.

Now, MORCK BRUSHES are made with Hog and NEOCETA Bristle . . . and tests from coast to coast prove them exceptionally fine brushes . . . carry and spread paint evenly and smoothly over a maximum area. (Also made with Hog Bristles and Horse Hair.) From a cost and production standpoint, center your buying around MORCK BRUSHES. Guaranteed to give satisfactory working performance. Consult your supplier, he knows the true values of these brushes.

Morck Brush Division

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BRUSHES · PAINTS · GLASS · CHEMICALS · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

it to the thicknesses required for any particular production job. Equipment handles roll stock up to 26 in. in diameter and to 65 in. wide.

548

Detachable V-link belt for vibration-free service



A detachable V-link belt that is prestretched, will not slip, and which can run in either direction, is in production by *Brammer Co.* This low cost V-link belt has features that prevent distortion after usage and permit smooth vibration-free service at top speeds. Links contain more plys than on other V-link belts, are uniform in camber and dimension. Links are made from tough woven cloth impregnated with top grade heat and oil resistant crude rubber. A convex stud head assures greater strength and longer service life. Non-slippage feature is due to high coefficient of friction and a perfected wedge action.

549

Cushion-type wrapping for in-transit storage

This cushion-type wrapping, called Cadwrap, for protecting large or oddly formed parts or products from in-transit and storage damage, consists of heavy, tough, crepe papers between which are fashioned cushioning layers of

ROTO-CONE

VARIABLE SPEED DEVICES

- Variable Speed Pulleys
- Adjustable Motor Bases
- V-belts and V-driven sheaves
- Countershaft Bases



INDUSTRY'S *Finest* YET MOST ECONOMICAL VARIABLE SPEED PULLEYS AND DRIVES

Smooth, infinitely variable speed can be yours with Roto-Cone, industry's finest yet most economical V to V variable speed drives. Equal and opposite movement of both discs of Roto-Cone variable speed pulley means V-belt always travels on a fixed center line. Pulleys are dynamically and statically balanced and do not have interlocking sheaves. Up to 4 to 1 speed change ratios are available. Wide selection of sizes from ⅛ to 15 H.P. Write for complete information.

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the man on the job..

Wants VICTOR Reliability



He gets reliability and efficiency in VICTOR welding and cutting torches, and regulators because they're built right.

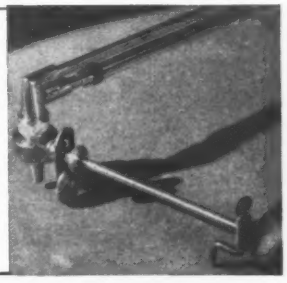
Precision machining assures leak-proof joints and ease of maintenance. Four head angles—90°, 75°, 45° or straight—and 4 lever positions—top or bottom and forward or rear of handle—enable you to choose the torch that exactly fits the job in hand.

VICTOR's complete range of tips, in sizes 000 through 16, are designed to give maximum cutting speed and gas savings on any job from light sheet to heavy plate cutting.

See for yourself why it costs less to own and operate VICTOR. Ask your VICTOR dealer for an on-the-job demonstration *TODAY*.

VICTOR CIRCLE CUTTING ATTACHMENT

adjusts to various heights and diameters from 1¼" to 28".



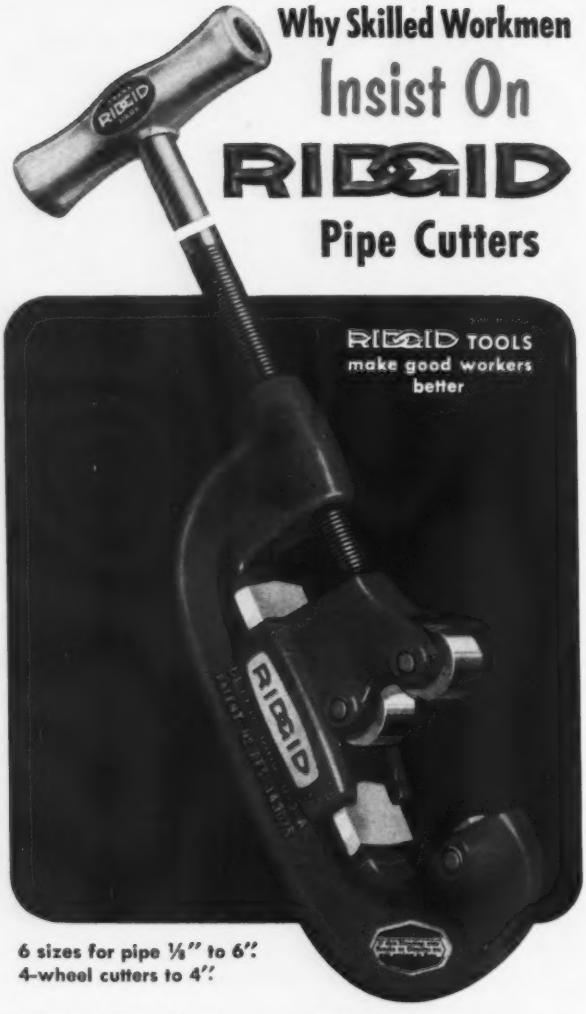
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Welding and Cutting Equipment Since 1910

VICTOR EQUIPMENT COMPANY

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Why Skilled Workmen
Insist On
RIDGID
Pipe Cutters



6 sizes for pipe ⅛" to 6".
4-wheel cutters to 4".

RIDGID Heavy-Duty Cutters assure you extra quick easy pipe cutting

★ High alloy thin-blade cutter wheels roll quickly through pipe with least effort—clean almost burrless cuts.

★ Special malleable housing guaranteed warp-proof, assures perfect tracking of cutter wheel—every tool factory tested.

★ Efficiency-balanced design for quick easy work—made for long hard service.

★ Order from your Supply House.

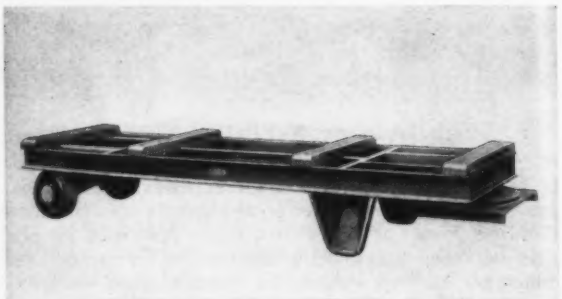
THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID
Work-Saver Pipe Tools

excelsior. Integral wrapping is then tailored to fit each part or product and is usually held in place by another device known as Cadclips which permits easy nesting and handling of oddly formed units. It has been found that in most cases Cadwrap gives adequate protection and offers considerable saving in packing costs. Manufacturer is *Cadillac Products, Inc.*

550

Two-wheeled trailer for general plant hauling



This two-wheeled trailer primarily designed for handling long lengths of material in confined spaces, was developed by *Phillips Mine & Mill Supply Co.* Pulled by either fork or platform lift truck, this unit also is adaptable for transporting multiple palletized loads and for general plant hauling. In operation, a lift truck engaged coupling mechanism mounted on an articulated turntable, lifts the skid legs free of the ground and moves the unit on its rear wheels. Cranes or lift trucks may be used to load and unload it, which can be used either with or without stakes. Unit is available in five models, ranging in length from 7 to 16 ft. All models have a capacity of 10,000 lb., and feature solid rubber-tired wheels with Timken roller bearings.

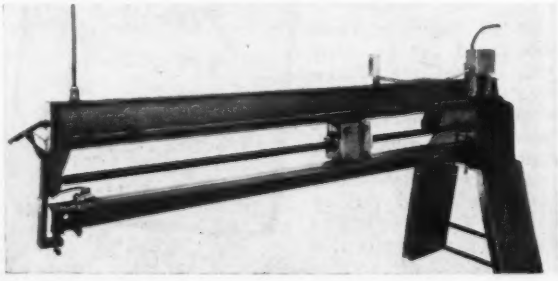
551

Globe hand screw machine is two-in-one

A 10-in. hand-screw machine for both low speed production work and high precision secondary operations is in production by *Globe Heat-Seal, Inc.* This extremely rugged machine with both slow and fast spindle speeds has a four-position quick-change gear box for instant speed selection. Twin V-belts reduce slippage. Accuracy is assured by precision tapered roller bearings in headstock with take-up features. Self-indexing bed turret and heavy-duty production cross slide are standard equipment.

552

This metal joiner sews a quick seam



Now in production is a sheet metal joiner which will automatically seam sheet metal of any thickness from 18 to 30 gauge in a matter of 40 seconds, an operation which would ordinarily take three times longer. Working from pressure derived from force which roller assembly exerts against an overhead structural steel beam, joiner travels in

one direction, automatically reverses direction for a second and final operation which smooths seam. Square or round piping or straight seaming may be handled by this machine. Manufacturer is *Standard Power-Groove Machine Corp.*

553

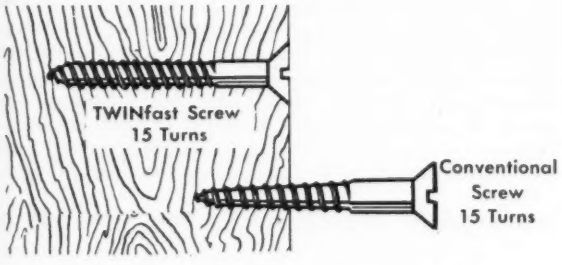
Dye penetrant for production-line inspection



"Chek-Spec," applied to parts being inspected, shows up even the smallest defect that extends to the surface. A fast, on-the-spot developing process then clearly locates and defines the extent of the flaws (arrow). An almost unlimited number of inspections can be made per hour of either ferrous or non-ferrous metals. Made by *Turco Products, Inc.*

554

Dual thread screw drives fast



Townsend Co. is now making a wood screw which has two threads with twice the pitch and which drives twice as fast as a conventional wood screw, holds tighter, yet is low in cost. This "Twinfast" screw has parallel sides, is not tapered, and therefore has more thread area in contact with material. Shank of screw is same diameter as thread pitch which eliminates the wedge action of standard screws. Made of steel or brass in all standard sizes.

555

New wafer motor can be mounted within piping or vent

A motor now being manufactured by *Reuland Electric Co.* which has a very short overall length is well suited to applications requiring a totally enclosed, air-cooled unit with a flat design. Frame design permits mounting within piping or vent by means of "ears," by drilled and tapped holes in endbells or by any other special requirement of user. When mounted in this manner, fan can be connected directly to motor's output shaft, eliminating pulleys, belts, brackets and fan shaft.

556

Rollpins make strong and lasting fasteners

Rollpins are roller chain fasteners which are chamfered-end, slotted steel cylinders that compress easily into a pin hole smaller than their own diameters, expand and lock in place until deliberately removed by hammer and punch. These fasteners not only outlast cotter pins but are equal in strength to cold rolled pins of the same diameter. Rollpins, which may be re-used almost indefinitely, are available on most of the larger pitches of both standard and heavy roller chains. Manufactured by *Morse Chain Co.*

Use coupon, page 81, for more information

Look! It's Really Portable—

RIDGID

"400" POWER DRIVE

On Wheels!



Wheel legs and front handles available to convert your present "400" to wheel model; or legs and tray to make bench model into stand.

Power for hand threaders, cutters, reamers now easily rolled where you need it!

★ *One man* can easily wheel-barrow this popular RIDGID power unit close to the work—think of the time and muscle saving!

★ And it stands still and delivers plenty of power—universal motor, forward, reverse, ⅛" to 2"—to 12" with geared tools.

★ RIDGID design 3-jaw chuck, 6 adjusting pinions, one always handy; self-centering workholder in rear.

★ Sealed-in lubrication—no oil to spill.

★ See it, compare it—buy the unequalled "400" at your Supply House!

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID

Work-Saver Pipe Tools

557

Cam-action desk stapler for varied fastening jobs

This stapler, manufactured by *The Heller Co.*, can stitch booklets, folders, magazines, maps, blueprints, time cards and perform many other fastening jobs. Using principle of long leverage and combining it with cam-action, this stapler accomplishes heavy work without effort. It is light in weight, takes up very little desk space and has a sure grip rubber-cushioned base that cannot mar the finest finish. Drives flat steel staples 11/46 to 9/16 in. long that come in long bars and can be loaded from either end of machine. This desk model stapler will operate endlessly without attention. Anvil or stitching head is interchangeable and gate requires no tools to open.



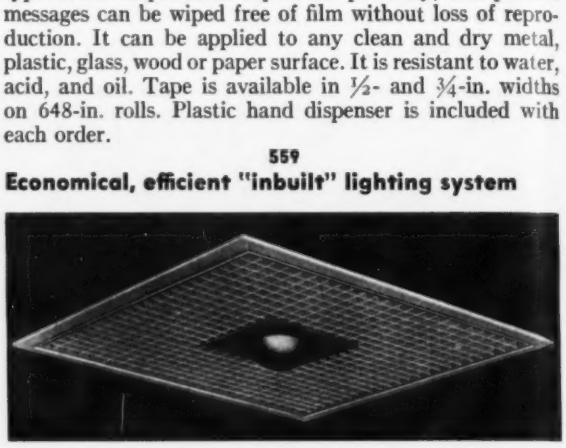
558

Labeling tape assures permanent identification

A smudge-proof pressure-sensitive labeling tape, manufactured by *The TapeMark Co.*, is designed for industrial inspection departments, tool rooms, and stockrooms. Tape's writing surface is located beneath a protective covering of transparent acetate film tape, and it permanently reproduces any message by simply using any blunt-pointed object. Message reproduces automatically on writing surface underneath, and cannot be erased or smudged. A stylus, dry ball-point pen or pencil can be used. Inkfree typewritten impressions reproduce perfectly, and penned messages can be wiped free of film without loss of reproduction. It can be applied to any clean and dry metal, plastic, glass, wood or paper surface. It is resistant to water, acid, and oil. Tape is available in ½- and ¾-in. widths on 648-in. rolls. Plastic hand dispenser is included with each order.

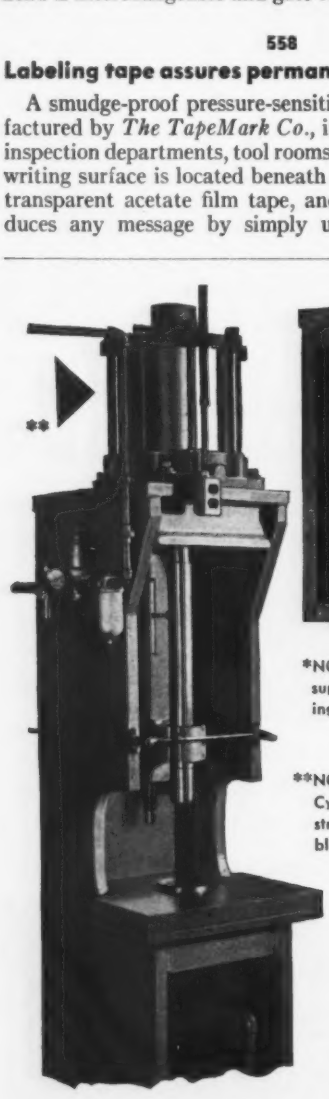
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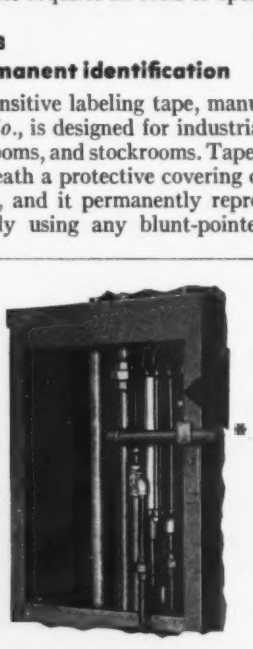
Economical, efficient "inbuilt" lighting system



A new modular incandescent lighting system, produced by The Smoot-Holman Co., is designed for built-in modern architectural use. Skylike systems can be installed for less cost than any other system providing comparable illumination. Individual units employ lamps with silvered or semi-silvered bowls, allowing variable light control from a wide-spread to a more concentrated distribution by an interchange of bulbs. This system may be relamped from floor with a pole type lamp change. Gives warm filament color.

Use coupon, page 81, for more information





*NOPAK Model "E" Cylinder supplies clamping or holding power for work-piece.

**NOPAK Model "D" 12"x8" Cylinder provides power stroke for "squeeze assembly" operation.

PRESS MOVEMENTS
Powered by
NOPAK CYLINDERS

Throughout industry, a variety of vital press movements are powered by NOPAK Cylinders, both air and hydraulic. For example, you'll find them on arbor presses, kick presses, punch presses, drill presses, baling presses, assembling presses, forming presses, power shears, power brakes, clamping devices, and similar equipment. NOPAK Valves control the cylinder movement.

If you build presses, there is probably a NOPAK Cylinder that's *just right* for your needs. Perhaps there are mechanically or manually operated presses in your plant which could be powered by air or hydraulic NOPAK Cylinders, and controlled by NOPAK Valves, to save valuable time, eliminate needless manual effort, speed up production.

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NOPAK
VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE

A 7019-½-H

560

You can finish 1,440 small parts per hour with this system

New finishing system washes, phosphatizes, rinses and dries parts, then dips them in paint, drains and bakes them, returning them to loading station for unloading by operator. In operation parts are placed on racks which are attached to machine's monorail conveyor. Racks, loaded with parts, pass through washing section where they are washed, phosphate coated and rinsed. After making a 180-deg. turn, monorail carries them through a glassless infra-red drying oven. Equipment for this unique operation is manufactured by *The Cincinnati Cleaning and Finishing Machinery Co.*

561

Automatic electric stapler

"The Staplex," a money-saver for industry, gives fast, automatic, fool-proof stapling. Both hands are free for work. Since machine has no time cycle, operator can set his own speed. Stapler is easy to load and maintain, and uses standard size staples. Manufactured by *The Staplex Co.*

562

General service pumps are space-savers

Use of standard mechanical shaft seals, instead of conventional stuffing boxes, thereby obtaining savings in floor space, shorter shaft lengths, improved performance and easier pump servicing is the outstanding feature of a new line of horizontal, split-case general service pumps now in production by *Peerless Pump Division, Food Machinery and Chemical Corp.* The pumps are available in discharge sizes from 1½ in. through 4 in.; capacity range, 750 gpm.; head range, 230 ft. General application is for pumping water and clear liquids up to 200 deg. F., where no solids are in suspension.

Occupational Dermatoses Cost You Money!

It's important to prevent the danger of skin rashes suffered by factory workers because industrial dermatoses mean lost man-hours and higher insurance premiums.

Triple-acting Vanfaire Lotion effectively guards against allergic or "sensitization" skin rashes in handling metals, lacquers, solvents, plastics, cutting oils and other sensitizing materials...antiseptically aids healing of minor scratches and abrasions . . . conditions and softens skin. Vanfaire Dispensers for plant washrooms provide Vanfaire Lotion at an average month's investment of 15c per employee. Workers *like* its mild scent and quick-drying, greaseless efficiency and appreciate management's consideration.

Available in gallons for dispenser use, small bottles for individual use. Write for technical bulletins and testing samples on your letterhead.



STEWARD-DAVIS, (aircraft maintenance company) states: ". . . it has eliminated any signs of dermatoses on the hands of employees in the cleanup and in any area where they are using solvents, caustic soda, and cresylic acid...no problem getting personnel to use it, as they have discovered the advantages."

Vanfaire Products
3757 Wilshire Blvd.
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Special Wire and Wire Specialties



Are you snarled up in a wire problem? Have you a part or process that requires a specially formed wire product? Has your source of supply for a special wire part dried up or slowed down? See us! Our job is to solve your wire needs. Our engineering, sales and production departments are yours to command. Please call on us.

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Weaving Wire • Music Wire • Mechanics Wire
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Bale Ties • Stucco Netting • Poultry Netting
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Write today for quotation and delivery or engineering assistance.

Wire Specialties Company
651 WALSH AVENUE SANTA CLARA, CALIF.

New Portable Field Manometer by MERIAM

For Checking Calibration of Gas Orifice Meters in the Field...

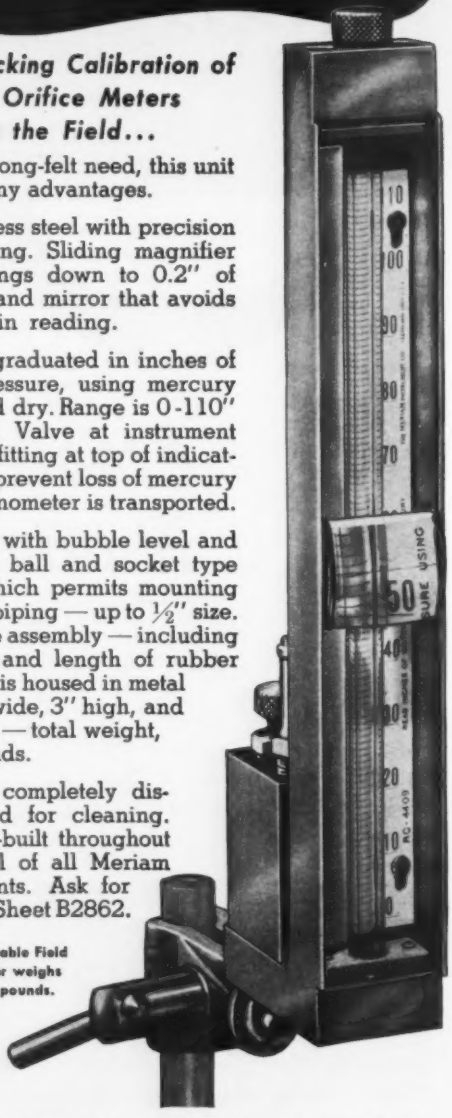
Filling a long-felt need, this unit offers many advantages.

All stainless steel with precision bore tubing. Sliding magnifier for readings down to 0.2" of water — and mirror that avoids parallax in reading.

Scale is graduated in inches of water pressure, using mercury calibrated dry. Range is 0-110" of water. Valve at instrument well and fitting at top of indicating tube prevent loss of mercury when manometer is transported.

Provided with bubble level and universal ball and socket type clamp which permits mounting to meter piping — up to ½" size. Complete assembly — including mercury and length of rubber tubing — is housed in metal case 5" wide, 3" high, and 14" long — total weight, 7½ pounds.

Can be completely disassembled for cleaning. Precision-built throughout — typical of all Meriam instruments. Ask for Catalog Sheet B2862.



Handy Portable Field Manometer weighs only 3¾ pounds.

THE MERIAM INSTRUMENT CO.
10988 MADISON AVENUE • CLEVELAND 2, OHIO
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MERIAM Instruments
ESTABLISHED 1911
MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

563

Pallet rack is easy to adjust



This is a tailor-made unit, designed to the actual dimensional specifications of the user's pallets. The rack has maximum dimensions of 60 x 60 x 120 in. Upright members are notched on 6-in. centers, and it takes one man only 30 sec. to move shelves up or down within the rack. The rack is designed to carry up to 3,000 lb. per shelf. It can be furnished in single or double face, or single or double entry groups. A product of *Berger Manufacturing Division of Republic Steel Corp.*

564

Portable pneumatic impact wrench has rolling ball cam for steadiness

Key feature of this portable pneumatic reversible impact wrench, manufactured by *Independent Pneumatic Tool Co.*, is a rolling ball type cam which increases efficiency and steady functioning of impacting mechanism. Wrench is available in two types of spindles, Size 24 with ½-in. square drive, and Size 24S with a 7/16-in. hexagon quick change chuck integral with spindle. Equipped with convenient side handle and trigger type throttle, wrench weighs only 5¾ lb., and measures 8-11/16 in. in length. A reversing valve is located at back of tool and tool can be equipped for either vertical or horizontal suspension on assembly lines, or for permanent locating of wrench from

TOUGH NEW WORK GLOVE with a TOUGH NEW COATING



SILVERTEX

These toughies will save you money, keep all hands cooler. Silvery coating reflects moderate heat radiation, resists cuts, snags, abrasion, and chemicals, won't crack or peel. Curved finger design, swing thumb, all standard styles.
Write for name of your distributor.

THE SURETY RUBBER CO.
Dept. A.

Western Division
544 Market Street
San Francisco 4

overhead balancers. Wrench is powered by a powerful air motor which transmits power to impact mechanism through a torque increasing planetary gear system. All heat treated alloy steel gear elements, precision finished, are mounted in full anti-friction bearings, providing extra power for heavy service and long life.

565

Easily-operated soldering tool



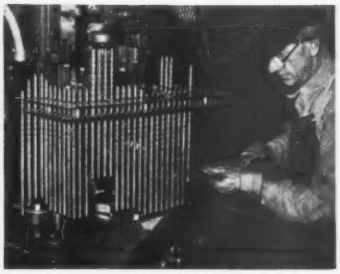
This versatile "quick-hot" transformer type soldering device heats instantly when trigger is pressed. It cools when trigger is released. Built-in spot light illuminates work. Long tip reaches spots otherwise inaccessible. Tool is light in weight and is easily operated. It is designed and manufactured by *Wen Products, Inc.* It can also be used for heating liquids, wood or leather burning and other art craft work. Operates on 250 watts, 110-120 volt AC.

SAVE THOSE FINGERS!

WITH AN

M & D Punch Press Guard

Operators Will Use This Guard Because . . .



- Designed and built by punch press engineers and operators.
- Provides maximum safety.
- Simple and flexible.
- No nuts, bolts or screws.
- Guard easily removable from press for changing dies.
- Pins adjustable vertically and horizontally to form desired barrier.
- Openings in guard can be arranged for ejection of parts or insertion of material.
- Guard stationary—Does not move with ram.

PRICED FROM $10 to $55

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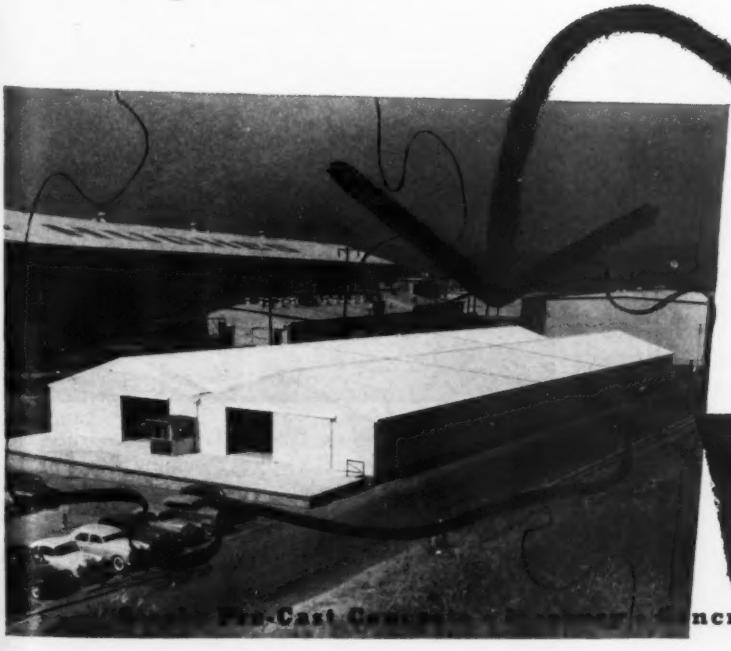
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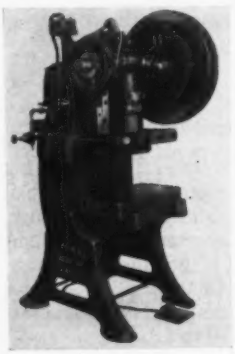
Rubber-lined drums

This line of 30- and 50-gallon rubber lined drums has been developed by *Latex Dipped Products Co.* They are lined with ⅛, or 3/16 in., 5 ply, 70 shore (semi-hard) smooth, nonporous, uncured natural rubber which is both abrasion and chemical resistant. It consists of five separate plies, each .047 in. thick, which are fused together in the curing process to assure complete coverage of metal and to minimize chance of air pockets or bubbles developing. Drums are available with inside lining only or both inside and outside lining.

567

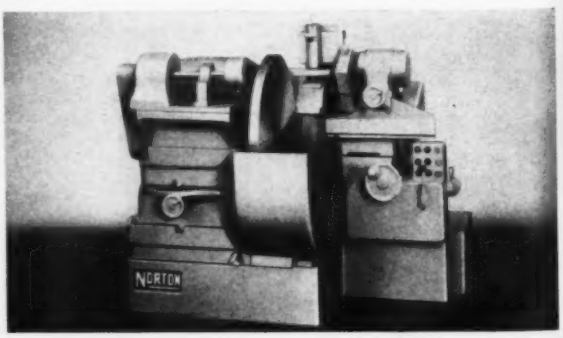
Punch Press Has Improved Clutch, Electro-Pneumatic Controls

A punch press manufactured by *Federal Press Co.*, is designed with a clutch-break mechanism in which compressed air expands a rugged rubber and fabric tube, thereby engaging clutch to any degree of "grip" required. This actuating tube is molded to structure of flywheel. Full operating torque results from 360 deg. of pressure applied near maximum diameter of flywheel. Overload protection is provided. Spring-tension brake is also released by compressed air. A single solenoid synchronizes air actuation of brake and clutch. Electro-pneumatic controls on this press permit single tripping (with hand push button or foot control) as well as continuous operation. Non-repeat mechanism gives desired protection in single-trip operation. Control panel also includes an inching button. Elimination of mechanical levers or linkage makes possible split second control. Operating shocks are absorbed by rubber actuating tube. Tube also compensates for uneven wear of friction shoes, insuring complete engagement with clutch drum.



568

Compressor grinding machine with automatic feed cycle



Workhead spindle on this compressor wheel grinding machine is designed for convenient mounting of face plates, chucks, or other workholding fixtures. Work up to 42 in. in diameter can be accommodated. Workhead is mounted on a swivel table and has longitudinal and cross adjustments. Workhead table also has longitudinal power traverse with automatic reversals from a hydraulic motor unit. To mini-

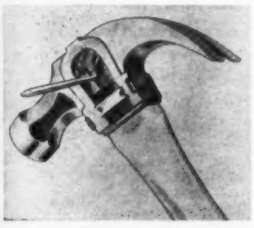
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mize manual tasks in external grinding operations, an automatic feed cycle, timer controlled, is furnished. This permits operator to tend two or more machines at once. A hand wheel feed mechanism is also provided. To ease and speed truing of the external grinding wheel, an automatic wheel guard type truing device is included. This device operates under push button control and trues wheel, minimizing disturbance of settings. Truing can be done with work in grinding position. For grinding internal surfaces of surfaces that cannot be reached with external grinding wheel an internal grinding spindle, mounted on front of wheel head is available. Spindles are available to take grinding wheels from ⅞ to 7 in. in diameter, and unit is quickly positioned along its dovetail slide for grinding or is easily retracted to permit external grinding wheel to be used. Manufacturer is *Norton Co.*

569

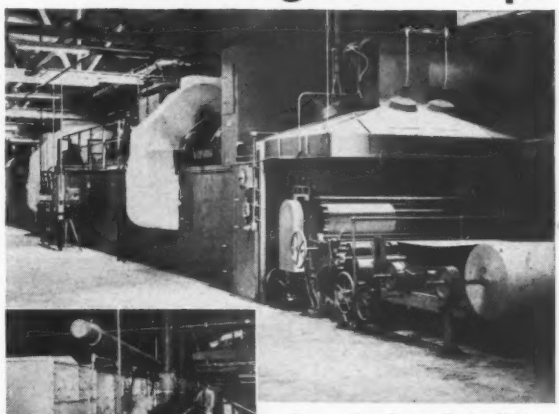
Hammer clip is "third hand" for user

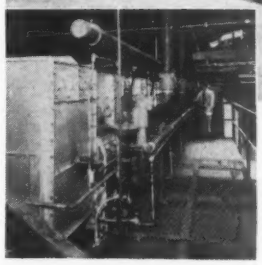
A hammer nail clip that is destined to eliminate many of industry's smashed fingers is now being manufactured by *Amsco Co.* This clip which fits most types of hammers, slips over head of hammer and is securely fastened by inserting and bending of ears through slots. Its spring steel clips on either side will handle anything from shingle nails to spikes. This allows free use of one hand while starting a nail, and also gives you a hammer's length extra reach. Always ready for instant use. Ideal for one-armed men.





Turning Saturated Paper Into Hard, Smooth Gleaming Table Tops





Above—Ross Treater Drying Unit 110 ft. in length with 2 heating zones and cooling section. Waldron treating apparatus in foreground.

Left—Group of 5 Ross Gas Fired Air Heaters.

another modern material made with

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Treating Equipment

The machine line pictured, one of the largest on the West Coast, mechanically impregnates webs of paper with phenolic resin. The saturated material then travels through the modern ROSS dryer, zoned for varying temperatures produced under absolute control by ROSS air heaters—then through a cooling section to the winders.

Because they best meet the exacting requirements for speed drying with uniformity in treating and drying, these ROSS-WALDRON treater lines are in wide use for a variety of similar converting operations.

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570

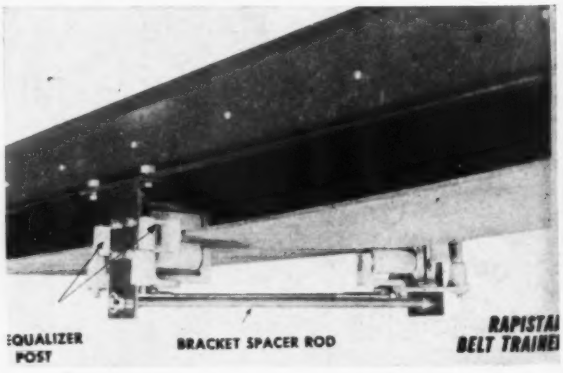
Self-loading platform truck with powered winch



A low-lift platform truck and crane manufactured by *Elwell Parker Electric Co.*, is designed to solve plant maintenance problems although it can also be used for handling production materials, which do not lend themselves to more conventional handling techniques. In addition to standard 4,000-lb. capacity, self-loading platform designed to lift and transport skids, truck is equipped with a powered winch for pulling heavy loads on or off platform. Boom is available fixed, or movable to swivel 180 deg., and permits hoisting loads weighing up to 2,000 lb. With this equipment, truck is well suited for transporting maintenance material, machinery, moving, motor or transformer placement, steam fitting and general plant repair work. Truck can also be used for lifting, carrying or positioning, heavy, odd-shaped loads such as castings, large assemblies. Power is supplied to individual motors which power drive platform lift, winch and hook by an eletcric storage battery or gas-electric unit.

571

Belt trainer eliminates creeping belts

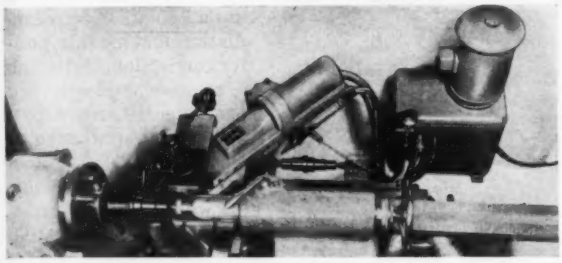


A positive-action belt trainer that automatically keeps wandering conveyor belts aligned, which is manufactured by *The Rapids-Standard Co.*, eliminates wear, down-time and excessive maintenance costs caused by creeping belts. It can be installed on any make of conveyor which has the return belt exposed beneath bed. It is designed for use on fabric or rubber-covered belts 3/16 in. or more thick, operating at speeds up to 200 fpm. Trainer does not interfere with normal conveyor operation, and does not mark or wear belt in any way. It is bolted to flanged rails on underside of conveyor. Flat sides of belt run between two sets of knurled spring loaded rollers, with the belt edges con-

tacting two sets of equalizer posts. If belt creeps to either side, it presses against these equalizer posts and cocks spring-loaded knurled rolls to new belt direction. This forces belt immediately back into perfect alignment, and trainer mechanism returns to normal setting ready for next belt movement.

572

Any lathe becomes an automatic tracer



A new Swiss hydraulic copying attachment, now introduced into this country, makes it possible to turn almost any lathe into an automatic tracer controlled machine. For a pattern the "Bondycop" uses either the first piece of a batch, or a jig. Since setting takes only a few minutes, mass production is practical even for small batches. Being merchandised in this country by *Morey Machinery Co.*

573

Puts brads in hard-to-reach places

Just introduced is the Markwell Bradmaster, a device for magnetically picking up brads of up to 18 gauge wire and driving them into wooden surfaces usually inaccesible, by hammer and tack, particularly in corners. Bradmaster is designed to assist in general repairs and maintenance, model making, cabinet work, manual training and school carpentry. Available from *Markwell Manufacturing Co.*

574

Magic fabric is low in cost

"ArcoSil" is a material recently developed by *Arrowhead Rubber Co.* consisting of a silicon rubber compound with improved fabrication techniques which result in lower cost. ArcoSil withstands temperatures as high as 700 deg. F., remains flexible at —125 deg. F., resists aging, ozone and most corrosive fluids and gases. It is several times more resistant than most silicone rubber materials. Material lends itself readily to forming of both simple and complex parts.



575

Mobile crane trucks can supplement overhead crane equipment

New line of mobile crane trucks, particularly adapted to handling heavy castings, machinery, bar stock, sheet metal packs and other irregular-shaped material in and out of flat, gondola or box cars, is now being produced by *Baker-Raulang Co.* These trucks which have 19-ft. telescoping booms, combine travel hoist, boom and slew motions in one sturdy, compact unit. They can also supplement overhead crane equipment by working in areas not served by such equipment. Capacities available are 6,000 and 10,000 lb.

Use coupon, page 81, for more information

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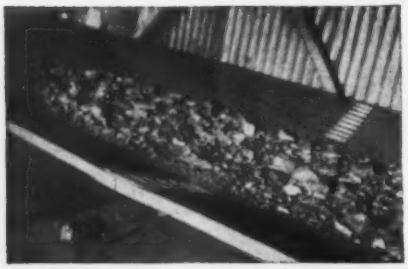
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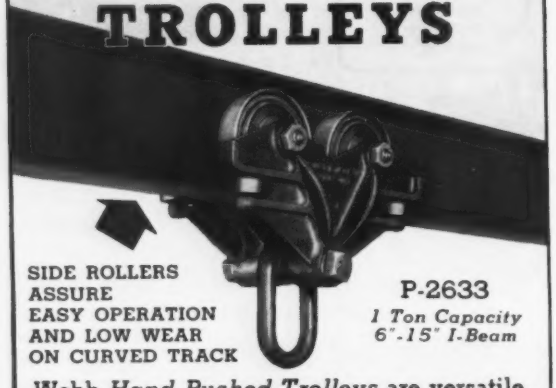


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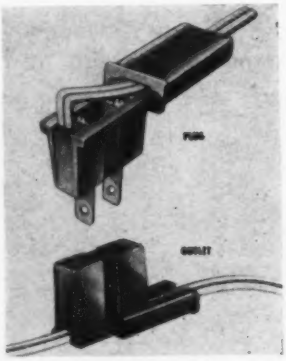
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CONVEYOR ENGINEERS AND MANUFACTURERS

576

Electric plug easy to attach

A real time-saver, this type of electric plug or outlet can be attached in five seconds to any standard No. 18 lamp or appliance parallel cord. Simply lay parallel wire in channel on top of moulded base and slide cap into place. This forces internal contact points to pierce insulation, making safe, positive connection. Outlet can be removed and attached elsewhere without exposing bare wire or damaging electrical cords. No tool required. It eliminates slitting wires apart and stripping off insulation. No screws or assembly are required. It greatly reduces production time for conventional plugs or outlets. Available from *Gilbert Manufacturing Co.*



577

Explosion-proof lighting fixture

This explosion-proof lighting fixture, manufactured by *Appleton Electric Co.*, is available in sizes ranging from 60 to 500 watts. It has a full circle venting—use of entire lower edge of hood as a continuous louvre. This feature combined with porous metal interiors, provides much more even heat distribution and definitely cooler operation. Wire-free canopy construction permits instant removal of entire fixture. By exchanging clean, freshly lamped fixture units

REALOCK FENCE

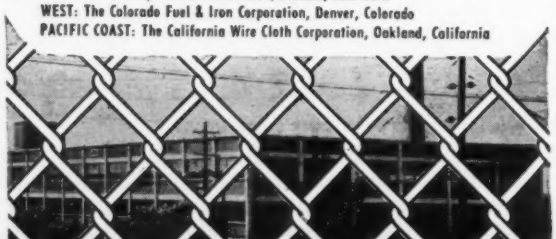
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Realock Fence provides real locked-in protection for your grounds and property. All fittings have bolts placed so that nuts are removable only from the inside ...thereby insuring safety from intruders.

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CF&I
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for those taken down, maintenance men can perform actual relamping and cleaning at work bench, without having to juggle parts on a ladder. To safely confine arcs, should current be on when fixture is removed, five full threads on canopy are engaged whenever contact is made or broken.

578

Lever switch with single-hole mounting

This miniature, telephone-type lever switch is well suited for use in instruments, radio equipment and communication systems. Single-hole mounting reduces assembly time and simplifies panel design, as switch may be mounted in any position. Lever action is smooth and definite, incorporating lock, non-lock, and no-throw positions. Lever handle is of black bakelite, tapered for attractive appearance. Little space is required since back-of-panel depth is only 2-1/16 in., while contact build-ups are 5/6 in. wide. Weight averages less than 1 oz. Standard contact arrangements are available for a wide variety of switching requirements. Tinned terminal lugs facilitate installation. Contacts of this switch, manufactured by *Product Acceptance Co.*, are pure, fine silver, permanently riveted to the contact springs. An alloy of silver and palladium is also available.





CONTINUOUS ROLLED METAL SHAPES AND TUBING offer a wide scope and variety as to size and design. They can do a better job with less waste and at less cost than by ordinary methods. Perhaps you can use Special Sections to advantage in your business.

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CONVEYOR BELTING — Repairs today mean fewer replacements tomorrow

IN ORDER to get the maximum service life out of conveyor belting, industrial users should take particular care to repair all belt damage as soon as it is discovered.

Belt fabric exposed to weather will absorb moisture if the protective cover becomes damaged, and may even become soaked. In warm weather, this condition leads to mildew and rot; in winter, ice crystals may gnaw at the fabric from within as the belt flexes. Thus, immediate repairs not only prevent the spread of damage, with its threat of premature failure, but also keep out the water which is the natural enemy of any conveyor belt.

The simple tools and procedures outlined here by Newell Perry, belting engineer of Thermoid Company, will help the maintenance man to give belting proper attention. An adequate repair kit includes sharp cobbler's knives and a stone to keep them sharp; a supply of emery cloth, rubber cement, inner tube patching rubber, rip plates and standard belt fasteners and accessories, together with rags and gasoline for cleaning. As each belt is installed, remnants should be kept, because they will prove useful in subsequent repairs.

To mend long and deep cuts which go through to the fabric, Perry recommended, open the cut, clean out all dirt, and cement the cut closed, allowing the cement to dry thoroughly before the belt is restored to service. Where bits of torn cover leave exposed spots with only slight damage to the fabric, remove the loose ears of cover stock by carefully cutting a curved and bevel-edged area around the spot; then sand the edges, apply cement, allow it to dry, apply tire patching rubber and finally skive the patch flush with the belt cover.

Where gouges have penetrated the belt, or longitudinal rips have occurred, these points must be cleaned, sanded, cemented and reinforced with rip plates at three-inch intervals. Transverse rips require similar treatment with standard belt fasteners instead of rip plates. Use rip plates on longitudinal rips only, and standard fasteners on transverse rips only. When holes in the belting do not permit the simple use of rip plates and fasteners, cut out the hole into the smallest possible rectangle with its sides parallel to and at right angles to the belt edges. Then, from belting remnants, cut an exact fit for the hole and insert the piece, fastening it with belt fasteners all around the patch. Cement all edges thoroughly. Where it is necessary to prevent seepage of fines through belt repairs, remove one ply of fabric from a belt remnant and place it under the fasteners and rip plates.

Vulcanized Patches

Vulcanized patches are superior to those described above, but require the addition to the kit of a portable vulcanizer, rubberized fabric, tie gum, cover stock, a one-ply knife and fabric pliers. In preparing a vulcanized patch, work down into the damaged belt as far as necessary by removing progressively smaller blocks of fabric with each successive ply. Clean, roughen and cement the cavity, neatly fit in blocks of new fabric and finally apply the uncured cover. Skive the edges of the patch flush, and vulcanize. Such patches cannot be made successfully unless the belt is dry, because the presence of moisture will permit the development of internal steam blisters. Only very large users of conveyor belting will find it necessary to vulcanize their own belt patches and splices.

New Magnetic Brake That Eliminates Levers And Linkage Makes Industrial Debut

A COMPLETELY NEW magnetic brake design that eliminates all levers and linkage found in conventional units has just appeared on the industrial scene. This brake contains only six major operating parts, and it features a direct, automatic set and release action between the solenoid and armature.

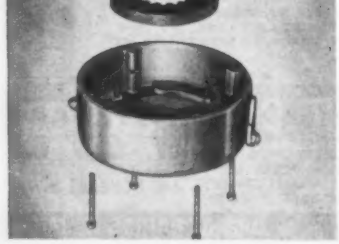
In addition to this new operational feature, the solenoid is of a one-piece "doughnut" design that permits the motor's output shaft to extend completely through the brake. This feature permits the user to utilize both ends of the motor shaft for powering two pieces of equipment when desired. Ordinarily, one of the motor's output shafts would have to be dead-ended at the brake, according to customary current design practice.

Reuland Electric Co., Alhambra, Calif., developers of this unit, have produced a magnetic brake that is ideally suited to fluid-coupled motors and gear reducers because of the double-end feature. The brake is installed on the output shaft of the fluid coupling with the shaft extending through the brake for hook-up to the load.

Both weight and overall length of the brake are about one-half that of all other makes.

Lining wear is automatically compensated for by spring tension. Brake torque remains the same and the usual inspection and hand adjustment procedure is thereby eliminated.

HERE ARE the six major operating parts for the new magnetic brake.



Instant Action

Direct action between solenoid and armature (instead of through levers and linkage) provides instant set and release.

Brake sets by spring action when current is off, and it releases automatically when current is reapplied.

Manual release permits rotating of motor's shaft by hand, if desired. Brake automatically resets when current is applied.

Removal of four machine screws releases housing to expose all parts. The disc type lining can be replaced very quickly. The one-piece cast housing is dustproof and weather resisting.

Reuland magnetic brakes are available in three, 10, and 25 ft.-lb. continuous duty ratings, and in 15 and 35 ft.-lb. intermittent duty types. They can be mounted on existing electric motors by means of regular Reuland mounting methods, or by use of NEMA "C" face type endbells.

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CALIFORNIA

VENEER VENTURE—Pacific Coast Co. makes deal with Pacific Laminates, Inc., for their green-plywood veneer plant at Leggett Valley in Mendocino County. About five miles separate mill from a stand of redwood and Douglas fir acquired by Pacific Coast Co. in $1,500,000 purchase of Howard E. Casteel Lumber Co. Improvements will be made to increase plant's capacity to 280,000 sq. ft. of one-eighth in. veneer per shift. Finished product is being sold under long-term contract to Sonoma Plywood Co., and to California Pacific Plywood, Inc.

COASTAL GAS ASKED — El Paso Natural Gas Co. files revised applications with Federal Power Commission requesting more natural gas for customers in California, Arizona, New Mexico and Nevada. Under this proposal, an extra 300,000,000 cu. ft. of gas would go daily to Southern Counties Gas Co., to Southern California Gas Co. of Los Angeles, and to Pacific Gas and Electric Co., San Francisco. Nevada Natural Gas Pipe Line Co., Las Vegas, would get 20,000,000 extra cu. ft. daily.

GENERAL PETROLEUM HOUSING—A new $500,000 engineering building is under construction at General Petroleum Corp.'s refinery in Torrance. Structure will house 131 engineering and administrative personnel in a 32,500 sq. ft. area. P. J. Walker Co. is constructing, and Albert C. Martin & Associates made building design.

NEW RUBBER PLANT—New plant of Union Rubber Co., located at 1002 77th Ave., north of San Leandro Blvd. in Oakland, has 21,000 sq. ft. of floor space and represents an investment of over $275,000. Plant serves tire recappers in Northern California, Oregon, Washington and Idaho.



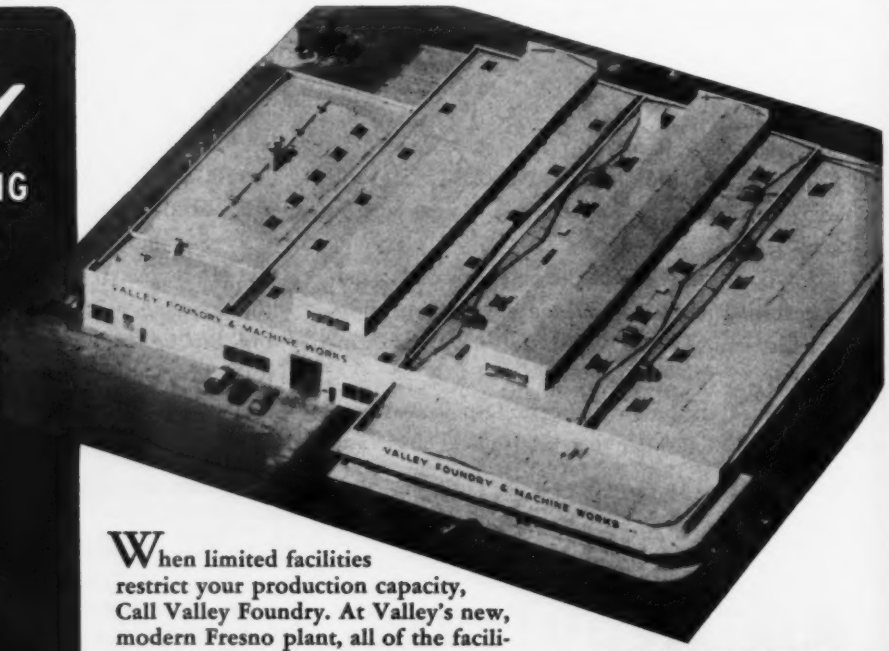
BRAKE SHOE COMES WEST—American Brake Shoe Co., New York, purchases plant and property formerly owned by Jumbo Steel Co. in Azusa. Brake Shoe's American Forge Division will use plant to start a West Coast steel forging operation about the middle of this year.

POWER PLANT PLANNING—Pacific Gas & Electric Co. files application with State Public Utilities Commission for permission to build a $75,000,000 steam electric generating plant near Pittsburg. An additional $8,000,000 will be spent for connecting lines. PG&E also plans to extend its Pit River hydroelectric de-

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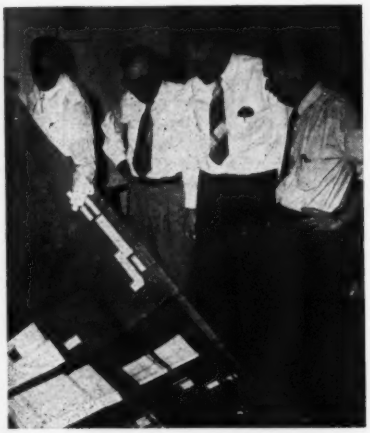
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velopment in Shasta County by constructing two new powerhouses, Pit 4 and Pit 6, at an estimated cost of $45,000,000. Together the projects will add 144,000 kilowatts of generating capacity to company's system.

GOODRICH GOES ALL OUT—Four executives of B. F. Goodrich Co. are shown here looking over blueprints diagramming a $2,000,000 expansion program which Goodrich will begin this year at its Los Angeles tire and tube



plant. Left to right are J. E. Gulick, general manager tire manufacturing division; H. E. Cook, chief engineer, both from Goodrich offices at Akron; J. F. Sweatt, Los Angeles plant manager; and E. S. Park, recently retired L. A. plant engineer.

YOUNG SPRING'S CONTRACT—L. A. Young Spring & Wire Corp., 111 San Leandro Blvd., San Leandro, is awarded a $5,000,000 contract to assemble fuselages for Douglas Aircraft Co. Re-tooling of plant will take about six months. Upon completion, an estimated 1,000 new employees will be added to working list.

ROSENBERG GROWS — Rosenberg Bros. & Co., Inc., subsidiary of Consolidated Grocers Corp., will spend over $700,000 to enlarge its rice milling, drying and storage facilities at Biggs, Calif. Planned expansion program will triple storage capacity.

SCORPION ORDER ENLARGED — Rhodes-Lewis Co., Los Angeles, a Mc-

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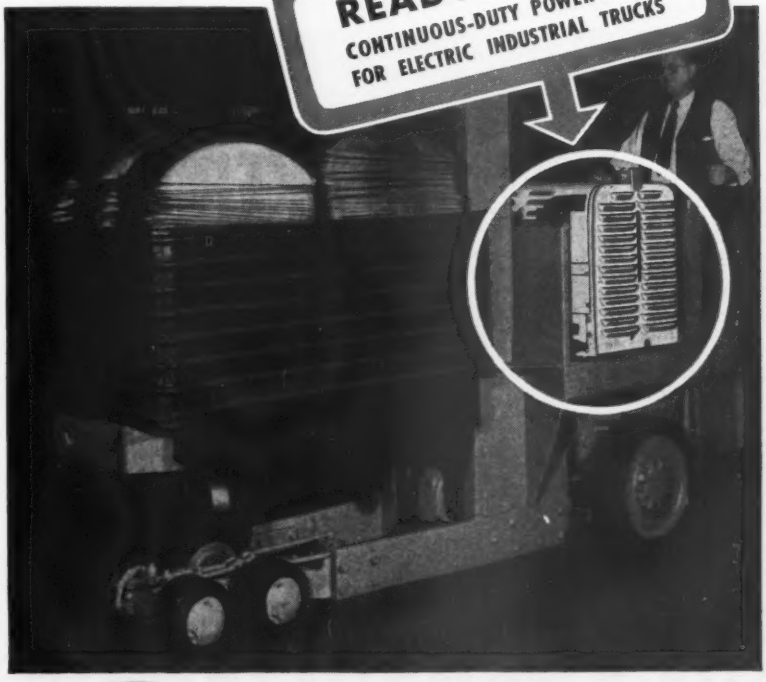
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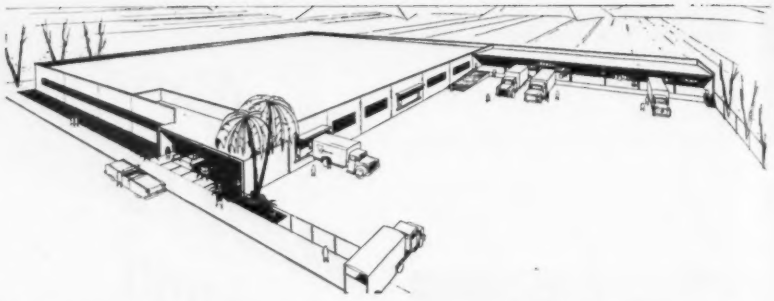
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Culloch Motors subsidiary, receives an additional $750,000 order for F-89 Scorpion crew-ejection seats. Order covers increased production of both pilot and radar-operator ejection seats for Northrop F-89 Scorpion, new standard all-weather interceptor of U. S. Air Forces.

ASBESTOS-CEMENT—Keasbey & Mattison Co. of Ambler, Pa., will put its tenth factory at Santa Clara, on a 26-acre site opposite Owens-Corning Fiberglas. First unit, 700 x 110 ft., and costing $2,750,000, to be completed by March 1953, but not ready for operation then. Will employ 150 people in plant, 25 in office. First product is asbestos-cement pressure pipe, 4 to 16 in. in diameter, for water, sewage and oil field drainage, with flue pipe, asbestos roofing, siding and shingles to follow later. Initial capacity 4 tons pipe per hour. Annual requirements 9,000 tons of cement, 3,000 tons silica sand, 3,500 tons asbestos fiber.

TETRAETHYL LEAD — Coast's first tetraethyl lead plant will be located in Contra Costa County, costing $1,200,000. Quimico Company, headed by Jacob Guehring. One of main supplies required will be ethyl chloride, which can be made close by at Dow Chemical's Pittsburg plant. West's present supply comes from du Pont at Wilmington, Del., or Ethyl Corp., at Baton Rouge or Houston.

HOFFMAN ELECTRONICS—Hoffman Radio Corp. establishes a wholly-owned subsidiary, to specialize in field of electronics. Hoffman Laboratories, Inc., operating as a separate corporate entity, will be housed in three plants—3761 South Hill St., and 3716 South Grand Ave., in Los Angeles, and 335 So. Pasadena Ave., Pasadena.



L. A. TRANSPORT BUILDS—Building commences on a $400,000 addition for facilities of Los Angeles Transort & Warehouse Co. at 3155 Leonis Boulevard in Vernon. New warehouse and dock face Leonis Blvd. on 275 ft. of frontage and have a 10-car Union Pacific Railroad spur track at rear. Building area plus parking space totals over 60,000 sq. ft. Buttress & McClellan designed structure and are erecting it. Present offices and warehouse of Los Angeles Transort at 2856 Leonis Blvd. will be maintained to augment new facilities.

BLACK & DECKER WAREHOUSE—Black & Decker Mfg. Co. buy a large acreage in Richmond, Calif., where they plan to build a warehouse with more than 30,000 sq. ft. of floor space.

SAFETY FOR DEFENSE—Bay Area Industrial Dispersion Committee and U. S. Department of Commerce have government approval on a study outlining local application of a plan for locating new defense-supporting industries beyond critical target zones. San Francisco Bay Area plans are first to be given formal acceptance. They will be used as a pattern for dispersion of defense industries in all other U. S. metropolitan areas.

BENDIX AVIATION ADDS ADDER—Northrop Aircraft, Inc., Hawthorne, sells exclusive rights for manufacture and marketing of "Maddida," a company-developed electronic computer, to Bendix Aviation Corp.

NEW STEEL CASTING PLANT—General Metals Corp., a Transamerica subsidiary, will build in Oakland a plant adjoining present facilities for manufacture of heavy commercial steel castings and special steel castings used in making ordnance materiel being procured by San Francisco ordnance district. New structure will cover three acres of ground and will cost about $5,000,000.

CARTRIDGE CASE CONTRACT FACT—Army Ordnance awards Mission Appliance Corp., Los Angeles, a contract authorizing $700,000 expenditure for equipping a plant to produce cartridge cases. Mission Appliance has leased a building in Whittier to take care of project.

WESCO WATERPAINTS SOLD—National Gypsum Co. purchases Wesco Waterpaints, Inc., Berkeley, for approximately $2,250,000 in National Gypsum stock. Wesco's Western plants, producing paints and paint powders, are in Berkeley, Los Angeles and Seattle.

STECHER-TRAUNG PLANS—Stecher-Traung Lithograph Corp. acquires a plant site in Redwood City and has plans to build a factory there. Company will eventually sell its San Francisco plant.

NEW DROP FORGE PLANT—Arcturus Manufacturing Corporation breaks ground on its 4½-acre site at Venice for a $3,500,000 drop forge plant. Facility, to include hammers weighing 8,000, 12,000 and 16,000 lbs., will make Pacific Coast aircraft industry largely self-sufficient in its requirements for large steel forgings.

WESTINGHOUSE WANTS WIDENING—Westinghouse purchases six acres of land adjoining its Sunnyvale plant for future expansion requirements. Manufacture of 60,000-kw. turbines will be

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an important product of Sunnyvale operation from now on. It is also in process of building world's largest rotating machine, an air compressor for Air Force use. Installation of 40-ft. horizontal boring mill is necessary for job.

PROGRESS FOR IMPORTANT PORT—Port of Stockton takes West Coast lead in bulk ore shipment prestige as it starts construction on largest, fastest and most efficient belt conveyor system available to Pacific shippers. It is predicted that annual flow of ore through Stockton's port will average 1,000,000 tons.

CERTIFICATES OF NECESSITY—Defense Production Administration approves another batch of tax amortization certificates of necessity for Western industry. In California, certificates are granted as follows: Pacific Gas & Electric Co., two certificates, one for Humboldt County power facilities, $135,642 approved 20%, the other for $151,445 Muroc pipeline, 50%; Colling Engineering Co., Culver City aircraft parts plant $174,970 for 50% write-off; Mar Vista Engineering Co., Los Angeles, aircraft parts, $83,260 for 70%; Tubing Appliance Co., Inc., Los Angeles, equipment parts, $80,170 for 50%; and Mars Engineering & Mfg. Co., Burbank, aircraft parts, $135,880 for 80%.

EUREKA REDWOOD — Eureka Redwood Lumber Co., wholly-owned subsidiary of M. & M. Woodworking Co., Portland, Ore., buys Pacific Lumber Co.'s mill and yard at Eureka, Calif., for a reported $4,500,000. Sale includes mill, 17,000,000 ft. of lumber and present log inventory. Pacific Lumber Co. will continue handling sale and distribution of entire output of mill at Eureka.

KAISER DOLOMITE — Kaiser Aluminum & Chemical Co. begins operations at its freshly finished $396,000 dolomite separation plant in Natividad. Calcine domolite and dead-burned dolomite in connection with aluminum production will be produced.

STEEL EXPANSION — Winston Steel Works, Sacramento, producer of prefabricated steel buildings, purchases Seiler Iron Works, Stockton. In order to double plant's present steel fabricating capacity, more equipment will be installed.

AIRLINE LINKS LANDS—California Eastern Airways, Inc., and Osaka Shosen Kaisha, one of Japan's largest steamship companies, join in planning an intercontinental airline linking Japan, United States and South America. New service to be known as "Japan International World Airlines."

STEELCOTE ANNOUNCES—Steelcote Mfg. Co. of St. Louis, manufacturer of protective coatings and liquid stainless steel, expects to build a plant in the San Francisco Bay area, according to D. J. Spieldock, Pacific Coast manager.

COLORADO

WHAT PRICE WINCHES?—Silver Engineering Works, Inc., Denver, is given okay by National Production Authority to get scarce metals for use in a $3,000,-



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GOODYEAR GREAT FOR GROUND BREAK—Supervising ground-breaking ceremonies for Goodyear Tire & Rubber Co.'s new $1,500,000 warehouse and office building in Los Angeles Central Manufacturing District are (left to right) Dent W. Sanford, vice president of Goodyear-California; E. H. Farrar, sales manager for Central Manufacturing District; H. T. Ewald, Western division manager of real estate for Goodyear; W. R. Schroll, Southern California mortgage, loan and investment manager; Charles B. Gouert, head of Western real estate division for Prudential Life Insurance Co.; and William P. Neil, engineer and contractor for project.

000 naval defense project. Company, to produce mine sweeper winches on a navy sub-contract, will increase its present labor force of 200 to about 300.

IDAHO

DPA CERTIFICATES — Defense Production Administration certificates are granted to Utah Power & Electric Co., Scoville power facilities $282,765 for 35% write-off; and Phillips Petroleum Co., Burley oil storage, $421,075 for 40% write-off.

MONTANA

BIG FREEZE—Stockholders of Farmers Union co-op cannery in Polson approve plans for construction and operation of a freezing plant in conjunction with co-op's cannery.

MORE ZINC COMING — Anaconda Copper Mining Co. reveals that Kelley mine in Butte area is now producing 2,000 tons of zinc daily, a figure to be increased to 9,000 tons within a year. A $4,000,000 modernization and expansion program will increase Anaconda concentrator capacity to 32,000 tons of ore a day.

ANOTHER UTILITY SOLD—Montana Power Co. buys Superior Electric Light, Telephone & Water Works Co. at a price of more than $250,000.

SUGAR BEATS IT—Operations are being terminated at Utah-Idaho Sugar Co.'s sugar beet factory in Chinook, and plant will be moved to Washington state. Great Western Sugar Co. plans to make arrangements with sugar beet growers of Chinook area to contract for and receive their beets.

AMERICAN CHROME PRODUCTION —Under a nine-year contract with Defense Materials Procurement Agency, American Chrome Co., subsidiary of Goldfield Consolidated Mines Co., Reno, Nev., will produce 900,000 tons of chrome concentrate from its Mouat Mine. During first of program, American Chrome will be equipped to produce 1,000 tons of ore daily.

NEVADA

MORE COPPER COMING—Anaconda Copper Co. sets July 1953 as probable date of full scale copper production at its new $40,000,000 project near Yerington. Thirteen thousand tons of ore per day will be mined at Anaconda's open pit. Of this figure, plant now under construction will treat 11,000 tons each day. Production of 60,000,000 lbs. of copper a year for first two years and 66,000,000 lbs. annually for another eight years is estimated.

MAGNESITE IS BASIC ASSET—Basic Refractories, Inc., Cleveland, Ohio, acquires physical assets of Sierra Magnesite Co. of Nevada. Firm also leases patented mining claims adjoining its property at Gabbs to be operated in conjunction with other properties worked by company.

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STAUFFER OFFER—Stauffer Chemical Co. agrees to purchase, from State of Nevada, facilities at Basic Magnesium plant at Henderson for some $4,250,000.

NEW MEXICO

OIL CO. SALE—Gulf Coast Western Oil Co. purchases all of Willingham Producing properties in Lea County for $275,000. Properties consist of 1,160 acres located 25 miles south of Hobbs. They include 27 producing oil and gas wells and several undrilled proven sites. Property production was over 39,000 barrels of oil and 20,000 of gas in 1951.

ECONOMICAL WASTE PLANNED—International Minerals and Chemical Corp. will start construction on a $2,500,000 plant in Carlsbad area to produce important defense materials from industrial waste. Magnesium oxide and hydrochloric acid will be drawn from a waste liquid now used in production of potassium sulfate.

OREGON

ALBINA BUILDS BULK BARGES—Alaska railroad awards contract for construction of two large bulk oil barges for operation on Yukon River to Albina Engine & Machine Works, Inc., Portland.

CLEANER PRODUCTS IN PORTLAND—Pennsalt of Washington adds production of company's B-K line of alkaline cleaners and bottle washing compounds at its Portland works. Products, formerly supplied by parent company works at Wyandotte, Mich., will be distributed through Western jobbers already handling line.

SILICA DEAL—Harbison-Walker Co., refractories concern makes agreement with Bristol Silica Co. for joint operation of Bristol silica quarry in Jackson County. Bristol will continue quartz quarrying operations to supply its crushing plant on Rogue River. Harbison-Walker will also quarry quartz and ship to a San Francisco Bay Area plant where silica bricks are made.

WEYERHAEUSER HITS ON HARDBOARD—Weyerhaeuser Timber Co. formulates plans to enter hardboard manufacturing field with a plant to be constructed at Klamath Falls. Building will begin when NPA gives go ahead, and completion of job is set for spring 1953. Annual plant capacity of 90,000,000 sq. ft. of ⅛-in. board is planned.

CERTIFICATE OF NECESSITY—Application for $3,000,000 with 60% write-off from Pacific Portland Cement Co., Grants Pass cement works, is approved by Defense Production Administration subject to check later by Bureau of Internal Revenue after itemization of certain facilities.

WASHINGTON

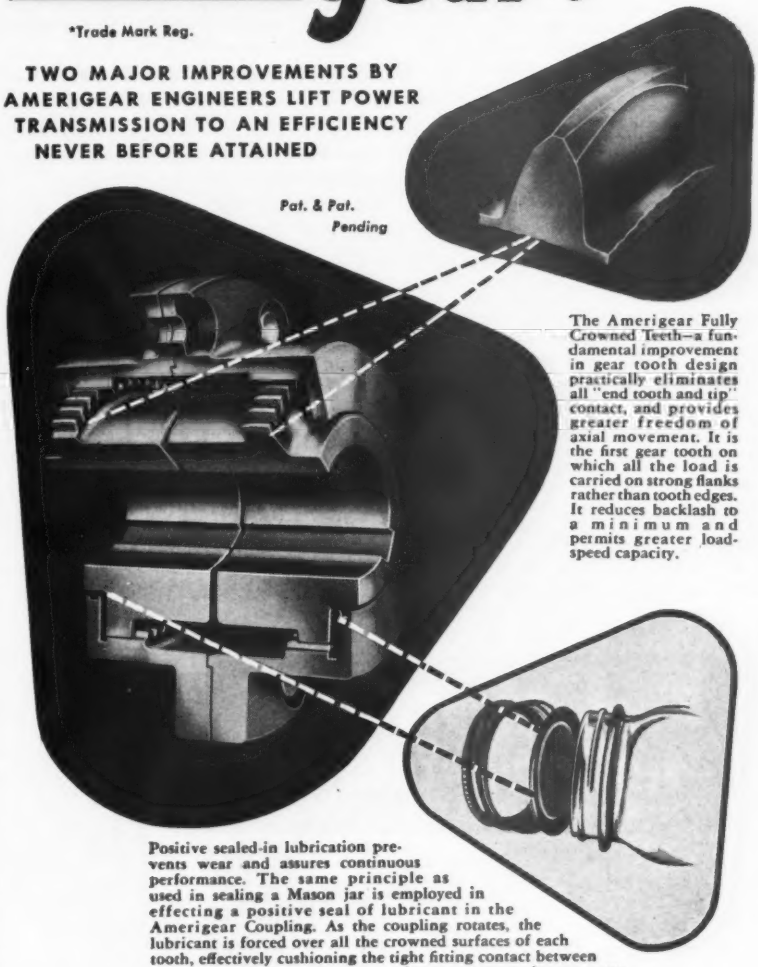
GAS ONE STEP NEARER—Westcoast Transmission Company, Ltd., is now the

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fair-haired child in the scramble to get approval from Alberta authorities for exporting natural gas to the United States. Northwest Natural Gas Co. heretofore apparently had the headstart. Alberta's petroleum and natural gas conservation board recommended that Westcoast be given permission to export from the Peace River area an estimated surplus of 300 billion cubic feet for 22 years, but that not more than 42 billion be exported in any one year. Considerable doubt expressed whether such small export is economically feasible. The various applicants for export permits had hoped to be able to draw on the southern Alberta fields, where the supply is far greater. Premier Manning of Alberta approved the Westcoast permit, but two more approvals are required, from Canada's Federal Board of Transport Commissioners and the U. S. Federal Power Commission.

CARBON ON RENTON — Hi Carbon and Chemical Co. is incorporated for $1,000,000 with a Records coal carbonization process franchise to operate a 150-ton coal processing plant near Renton. Products will include fuel gas of 700 to 800 Btu. from which will be stripped benzol, toluene and gyolene. Ammonia sulfate liquor will be another by-product.

COLVILLE MILL BOUGHT — Justice Lumber Co. of Valley now owns Warren Lane sawmill in Colville. With re-opening of plant, 5,500,000 ft. of timber recently purchased by Justice Lumber from Colville national forest will be logged and hauled to mill which cuts 20,000 ft. daily. Mill waste will be used in supplying fuel to U. S. Gypsum Co.'s kilns at Evans, 20 miles north of Colville.

BOEING IN ENGINE BUSINESS—Boeing Airplane Co., Seattle, is now manufacturing lightweight gas turbine engines on a production basis for U. S. Navy. A new division has been set up in Seattle to handle design, production and marketing of compact 200-lb., 175-hp. engine used in generating electrical power for minesweepers.

CARBORUNDUM TO DOUBLE CAPACITY—Carborundum Co. of America plans an estimated $3,000,000 expansion program to double capacity of its three-year old silicon carbide plant at Vancouver.

DPA CERTIFICATES — Defense Production Administration certificates of necessity granted to Washington firms follow: Stack Steel & Supply Co., Seattle, $145,800 warehousing, 50% write-off; Pacific Coast Paper Mills, Bellingham, $659,261 of paper plant costing more than $1,400,000 with 40% write-off allowed; and Scott Paper Co., Everett works, $20,800,000 for 40%.

WYOMING

PIPELINE CONSTRUCTION CONSIDERED—General Petroleum Corp. is considering construction of an oil products line between Casper and Rawlins. Branch line would be about 100 miles long. It would connect with a line soon to be built from Sinclair into Salt Lake City, Utah.

SUSSEX OIL FIELD PLANT PLANNED—Continental Oil Co. plans on building a gasoline recovery and gas repressuring plant worth $1,750,000 in Sussex oil field, Johnson County. By repressuring method, plant will insure recovery of over 1,000,000 barrels additional oil during a twenty-year period. It will also make available 13,000,000 cu. ft. of natural gas and will recover approximately 300,000 barrels of natural gasoline from compression of natural gas.

MORE DRILLING — At least 16 wells are scheduled to be drilled in the southeast rim of the Powder River basin, indicating a revived oil activity in that portion of Wyoming.

Institute Planned

IN CONNECTION with the Western Packaging and Materials Handling Exposition at the Shrine Auditorium, Los Angeles, Aug. 12-14, a Materials Handling and Packaging Institute under the direction of the University of Southern California's industrial engineering department is planned. Formal approval by university authorities was pending at the time of going to press. It is to consist of two educational morning sessions.

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WESTERNERS AT WORK

California

CLIFFORD A. STEPHENS, formerly a senior compounding engineer for the *Firestone Tire and Rubber Co.*, Akron, Ohio, joins *National Motor Bearing Co., Inc.*, Redwood City, as chief rubber technologist. He succeeds HUGH STEWART.

Pacific Airmotive Corp., Burbank, appoints NEAL J. COLEMAN as vice president—administration. Coleman joined PAC in 1950 as assistant to the president and contract administrator.

J. E. TOUSSAINT is named a vice president of *Standard Oil Co. of California*. He joined Standard in 1922 as a construction engineer in that company's Richmond refinery. In 1941 he became general manager of operations for the producing department, and was advanced to head of that department in 1945.

LAWRENCE M. LIMBACK, former manager of operations, *Steel and Tube Division, Republic Steel Corp.*, Cleveland, joins *The Ryan Aeronautical Co.* as works manager.

Union Lumber Co. appoints BERNARD J. VAUGHN as director of industrial and public relations. JACK L. PRYOR of that firm's San Francisco office, succeeds Vaughn as office manager at Fort Bragg.

RICHARD D. LAW, recently with *Abbott Laboratories*, Chicago, is named office manager for *C. A. Norgren Co.*, Englewood.

DR. R. A. FISHER is named research coordinator at *California Spray-Chemical Corp.'s* Richmond office. He was formerly Portland branch manager.

A. R. KEMP is appointed vice president in charge of research for *Narmco, Inc.* Kemp formerly directed rubber and plastics research for *Bell Telephone Laboratories*, Murray Hill, N. J.

WILLIAM F. CODEJOHN is named assistant to president, *Gladding McBean & Co.* R. C. CONOVER, former production manager, southern division, assumes newly created position of assistant general manager for the four southern division plants. Other appointments include: HOMER DYE, production manager, heavy clay products; ROBERT S. HUGHES, production manager white ware departments; ADDISON HAWLEY, superintendent tile department.

New vice president and general manager for *Soulé Steel Co.* is EDWARD LEE SOULE', JR., former production manager for firm's entire West Coast operation.



Soulé



Monsees

Consolidated Vultee Aircraft Corp. appoints FULTON MONSEES as purchasing agent, succeeding J. C. BUCHAN who becomes supervisor of material control.

JOHN H. HARLEY joins *Sprague Electric Co.* as a member of radio interference filter group at company's application engineering laboratory, Culver City.

DR. JAMES DE JUREN, former physicist at University of California radiation laboratory, and authority on neutron measurements, joins Atomic and Radiation Physics Division of National Bureau of Standards.

American Potash & Chemical Corp. names ERNEST LEVENS to head its new organic section of the research department at Los Angeles.

J. WARREN GILLON, formerly assistant production manager of *Librascope, Inc.*, Glendale, joins *Dalmo Victor Co.*, San Carlos, as works manager. In his new post Gillon will supervise all production quality control and machine shop operations.

Crown Zellerbach Corp. appoints WOLFE C. GIGLER to position of production superintendent of its paper converting plant now under construction at San Leandro. Gigler was formerly superintendent of Crown's converting plant at Camas, Wash.

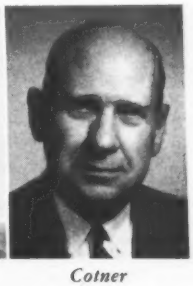
FRANK B. DUESTER, former executive secretary of *Chicago Retail Furniture Association*, takes over as executive secretary of *Northwest Furniture Manufacturers' Association* at Seattle.

GEORGE COLEY, in charge of *S & W Fine Foods* plant at Redwood City for the last two years, returns to *Schuckl & Co.* at Sunnyvale as vice president in charge of production.

JOHN C. SAMPLE rejoins *General Petroleum Corp.* (after an absence of three years) as assistant to president. Sample returns to General Petroleum from *Standard-Vacuum Oil Co.*, New York, where he has been in charge of that organization's marketing activities in South Africa, Australia, New Zealand and Japan.



Sample



Cotner

R. M. COTNER, assistant secretary and assistant treasurer of *Fibreboard Products, Inc.*, assumes duties as general credit manager, and will change his headquarters from Los Angeles to San Francisco.

T. E. MCEVEANY, formerly president of *Solano Iron Works*, Berkeley, becomes vice president and general manager of *Payne's Bolt Works Co.*, San Francisco.

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HARRY M. BAYLEY, JR., former vice president and general sales manager, is elected president of *Pacific Abrasive Supply Co.* He is succeeded by N. C. BAYLEY. LEO F. LAMB is appointed vice president and will continue his duties as treasurer of that company. M. P. TUTTLE becomes secretary and will continue to head San Francisco plant and direct San Jose office.



Bayley



Rees

Standard Steel Corp., Los Angeles, advances C. N. REES to vice president in charge of manufacturing. Rees, who has been with the company three years, will also continue his duties as sales manager. New treasurer for this company is ROBERT J. JOHNSON, former purchasing agent, and new secretary is K. G. THIES.

Kelite Products, Inc., appoints LOUIS MCDONALD as director of development and control laboratories.

A. M. ONDREYCO, former plant manager for *Vulcan Foundry Co.*, Oakland, is now associated with the metals division of the Oakland plant of *General Metals*. He is national director for the West Coast of American Foundrymens Society.

Included among new members of advisory divisional committee on scientific personnel and education of *National Science Foundation* is DR. JOEL H. HILDEBRAND, professor of chemistry, University of California.

VICTOR H. CLAUSEN is named to *California Redwood Association's* research and technical division at Eureka, replacing WILLARD E. PRATT who transfers to San Francisco office.

New dean of engineering division of *California State Polytechnic College* is HAROLD P. HAYES, former sales engineer for *Dudley Machine Corp.*, Mountain View.

New publications representative for *Bethlehem Pacific Coast Steel Corp.* is FRED EDMUNDS, who was formerly in charge of the News Bureau for *Los Angeles Merchants and Manufacturers Association.*

H. W. RICKER, manager of material at *Consolidated Vultee Aircraft Corp.*, is appointed assistant division manager of *Convair Guided Missile Division*, succeeding GAGE IRVING, who resigns to become general manager of *Hayward Industries, Inc.*, Glendale.

DONALD E. RICE, former assistant general superintendent of *U. S. Steel's* Pittsburg plant, is named general superintendent of that company's Torrance plant, succeeding OTTO A. KRESSE, retired. Rice is replaced by C. C. MORGAN, former superintendent of sheet finishing at Pittsburg. J. P. NEWMAN assumes Morgan's duties as assistant superintendent, sheet finishing; G. A. JEDENOFF, general foreman, cold reduction, moves up to assistant superintendent, sheet finishing. New general foreman is F. P. SMITH. E. N. ARCHIBALD takes over as general supervisor of inspection and testing.

Colorado

Climax Molybdenum Co., Climax, promotes C. J. ABRAMS to position of general manager. Abrams was general superintendend of operations prior to this advance. FRANKLIN COOLBAUGH, former assistant general superintendent, is named resident manager of operations.

HOWARD J. DAVIS is named assistant to the president of *The Colorado Fuel and Iron Corp.* Davis joined CF&I in 1940 to establish a welded wire fabric division. Following development of that department, he became manager of product research and development. In 1950 he was assigned as an assistant to the executive staff.



Howard J. Davis

Oregon

IRVIN H. LUITEN is appointed Oregon field representative of *Weyerhaeuser Timber Co.'s* department of public information, replacing ALBERT ARNST who takes over as editor of *The Timberman.*

New chief of materials handling equipment branch of *National Production Authority* is ROBERT W. SCOTT, former parts and service manager of *Hyster Co.*, Portland.

Utah

OSCAR A. GLAESER, assistant to vice president and general manager, *U. S. Smelting, Refining and Mining Co.*, is promoted to assistant general manager of Western operation for that firm.

Wyoming

ROBERT M. LEE is appointed personnel and industrial relations manager for *Shell Oil Co.*, Casper, having been transferred from a position as personnel supervisor in the firm's Houston office.

ASSOCIATIONS ELECT

Inland Empire Box Association: President, EDWARD NEILS, *Klickitat Pine Box Corp.;* vice president, OWEN SAWYER, *Peshastin Lumber & Box Co.;* treasurer, LYNN TWITCHELL, *Schmitten Lumber Co.;* secretary-treasurer, V. V. HEILIG.

Utah Mining Association: Secretary-manager, MILES P. ROMNEY; assistant manager, WALTER M. HORNE.

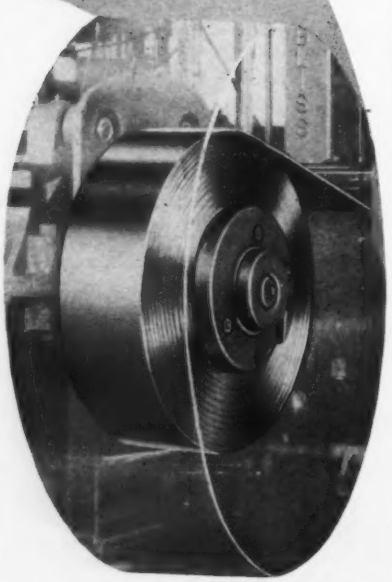
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Pacific Coast Section of the Society of the Plastics Industry, Inc.: President, LEE T. BORDNER, president, *Sierra Electric and Manufacturing Co.;* vice-chairman, LES SWANSON; secretary, JOE JAYNE; treasurer, BARTON THOMPSON.



Lee T. Bordner

Northwest Canners Association: President, E. I. PITKIN, *Eugene Growers Association;* vice presidents, JAMES E. KLAHRE, *Hood River Apple Growers Association;* VERNON WHITNEY, *Walla Walla Canning Co.;* executive vice president, C. R. TULLEY, Portland; assistant secretary-treasurer, A. L. HOBART, Portland.

West Coast Lumbermen's Association: (reelected) president, HILLMAN LUEDDEMANN, general manager and vice president, *Pope & Talbot, Inc.,* Portland; vice presidents, COL. W. B. GREELEY, Seattle; G. E. KARLEN, *Eatonville Lumber Co.,* Tacoma; JUDD GREENMAN, *Oregon-American Lumber Corp.,* Vernonia; executive vice president, H. V. SIMPSON; secretary, HARRIS E. SMITH; (newly elected) treasurer, W. A. CULKIN, *Stebco, Inc.,* Vancouver, Wash.

National Association of Manufacturers: Taxation Committee members: PAUL L. DAVIES, president, *Food Machinery & Chemical Corp.,* San Jose; E. ISRAELSON, general manager, *Dorris Lumber & Moulding Co.,* Sacramento; JAMES S. THOMPSON, president, *Pacific Electric Manufacturing Corp.,* San Francisco; CHARLES WEEKS, director, *Menlo Research Laboratory,* Menlo Park; KERMIT L. WILLIAMS, vice president and secretary, *E. H. Edwards Co.,* San Francisco; ARDEN E. DRESSER, vice president, *Morrison-Merrill & Co.,* Salt Lake City; H. R. WALDO, president, *Telluride Power Co.,* Salt Lake City; FRANK MCLISTER, president, *Kohler-McLister Paint Co.,* Denver; and O. W. WHITE, vice president and cashier, *First National Bank,* Colorado Springs.

Purchasing Agents' Association of Washington: President, ARTHUR ERICKSON, Northwest district purchasing agent, *Union Oil Co.,* Seattle; first vice president, M. C. MICHENER; second vice president, DEN SMITH; treasurer, E. R. JOUBERT; secretary, MILTON F. SESSIONS.

Western Transportation Council, Northern California Regional Committee: Chairman, FRED GALBREATH, manager, *Marine Exchange Office of America;* committee members, W. J. BUSH, president, *West Coast Terminals, Inc.;* THOMAS B. CROWLEY, JR., *Crowley Launch & Tugboat Co.;* HENRY DRATH, vice president, *Bank of America;* DON L. DULLUM, president, *Encinal Terminals;* RAYMOND B. GILES, *Pacific Coast Engineering Co.;* LOUIS ETS-HOKIN, *Ets-Hokin & Galvan Co.;* FRANK HOWLAND, manager, *Oceanic Forwarding Co.;* LLOYD HUGHES, assistant manager, *Port of Oakland;* FRANK REDFERN, foreign freight agent, *Union Pacific Railroad;* GEORGE E. TALMAGE, vice president, *Pacific Transport Lines;* and B. J. COFFEY, *Farnsworth & Ruggles.*

Utah Training Directors Association: President, MARLON S. BATEMAN, training director, *Utah Power and Light Co.;* vice president, DOC G. SPARKS, supervisor of management of training, *Hill Air Force Base;* treasurer, GRACE L. JONES, training director, *Auerbach Co.;* secretary, VON H. ROBERTSON, state director of trade and industrial education.

NEW OFFICERS of *West Coast Lumbermen's Association:* Seated left, *Hillman Lueddemann,* president; *Judd Greenman,* vice president. Standing left, *H. V. Simpson,* executive vice president; *W. A. Culkin,* treasurer.



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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

JEFFERY W. MEYER, released from active duty with U. S. Army, rejoins *Wilson & Geo. Meyer & Co.*, Pacific Coast distributor of agricultural and industrial chemicals. He directs sale of fertilizer materials, industrial chemicals, plastics and foundry coke at firm's San Francisco office.



Meyer



Slatky

Stanley Works, New Britain, Conn., names JOHN E. SLATKY sales representative for steel strapping division. He will work out of Stanley Works' San Francisco office.

Kurt Orban Co., Inc., Importer of German machine tools opens its first West Coast branch office in Seattle. FRANKLIN PRICE is general manager for branch. Firm is making further plans to open offices in Vancouver, B. C., and in other Western cities.

GEORGE W. HULDRUM, JR. takes newly created position of sales manager, *Western division, Shell Chemical Corp.*, San Francisco. In his new position, Huldrum heads sales activities in ammonia and ammonium sulphate fertilizers, solvents for protective coatings, plastics and resins, and insecticides.

Heat and Control, Inc., 285 Seventh St., San Francisco, is now West Coast area representative for *Bloom Engineering Co., Inc.*, Pittsburgh, Pa. New associate will handle Bloom Engineering Co.'s line of fuel burners and allied combustion equipment for steel mill and industrial furnaces.

Smoot-Holman Co., Inglewood, Calif., manufacturer of industrial and commercial lighting equipment, appoints GORDON LAURSEN, 512 W. Granite Ave., Albuquerque, N. Mex., sales representative for Colorado, New Mexico and Western Texas.

E. J. LEONARD, formerly field service engineer in Chicago office of *A. M. Byers Co.*, is transferred to this firm's Los Angeles office now located in Commercial Exchange Bldg., 416 W. 8th St. His new territory consists of Southern California and Arizona.

Sales offices for *Electro Metallurgical Co.*, a division of *Union Carbide and Carbon Corp.*, are now located at Union Carbide and Carbon Bldg., 2770 Leonis Blvd., Los Angeles (Vernon) 58, Calif. Credit and accounting departments remain at 22 Battery St., San Francisco.

Newton R. Crum Co. is new factory representative in Southern California and Arizona for *Philadelphia Gear Works, Inc.*, maker of industrial gearing and speed reducer units. Newton R. Crum Co. offices, formerly in Long Beach, are now at 7853 State St., Huntington Park, Calif.

C. A. Norgren Co., Englewood, Colo., names TED W. SESS a district representative in Southern California to work with GLEN K. MEAD in handling Norgren pneumatic product sales.

VERNON BENSON joins Los Angeles office of *E. V. Roberts & Associates*, factory representative, as a field engineer.

J. T. Hill Sales Co., and *J. C. Van Groos*, both Los Angeles electronic representatives, are now represented in San Francisco bay area and Northern California through association with *Charles E. Ault Associates*,

Standard Wire & Cable Co., Southern California jobber of electrical wire and cable, moves from 9608 Venice Blvd., Culver City, to a 10,000 sq. ft. office and sales building at 3440 Overland Ave., Los Angeles. New $75,000 headquarters, near Venice Blvd. and "Culver Center," was planned by Engineer *Robert H. Guynn*, and *Don Hanlon* was general contractor.



625 Laurel Ave., Menlo Park, Calif. J. T. Hill Sales Co. adds WARREN R. HUTH as a field engineer on industrial and technical accounts in Southern California area.

Hardfacing Sales & Engineering Co., Los Angeles and Oakland, opens new branch warehouse and sales office at 458 So. Main St., Salt Lake City. WM. HIBBARD is transferred from Los Angeles as manager and will serve Utah and Nevada territory from this new office.

WILLIAM J. BARNETT comes to Oakland, Calif., as West Coast sales manager for *Chemical and Pigment Div.* of *Glidden Co.*, Cleveland, Ohio.

Fruehauf Trailer Co. makes a new West Coast regional setup as follows: A. V. TICE, regional manager for West Coast; E. C. HENNING, Bay Area fleet sales manager; WALTER PAVELA, Bay Area district manager; JOHN HALWAX, used trailer sales manager for West Coast.

Los Angeles branch office and warehouse for *Ward Leonard Electric Co.*, Mt. Vernon, N. Y., moves to new, larger headquarters at 1605 E. Olympic Blvd., Los Angeles 21.

American MonoRail Co., Cleveland, Ohio, opens its Southern California district office at 4645 Anaheim-Telegraph Rd., Los Angeles 22. GORDON P. KAUTZ is manager of this office. Sales and engineering staff include ROBERT CHUBBUCK, ANDREW KOCELA and SIGMUND BERKOVIES. Control of company warehousing and fabrication within Southern California district is centered in new office.

Telex, Inc., Minneapolis, manufacturer of pillow-speakers and head-sets, appoints *E. V. Roberts & Associates*, Los Angeles and Phoenix, for representation in California, Nevada, New Mexico and Arizona.

Naugatuck Chemical Div., U. S. Rubber Co., promotes GERALD L. DENNIS to branch managership of West Coast operations with headquarters in division's newly completed West Coast plant and branch office in Los Angeles. He replaces J. RAYMOND MORATH, deceased.

Panama Lamp & Commercial Co., Inc., Seattle, San Francisco and Los Angeles, moves its southern office and warehouse to 326 South San Pedro St., Los Angeles. Company is new Pacific Coast representative for *Lincoln Lighting Products, Inc.*, Chicago maker of incandescent lighting fixtures.

Drake Steel Supply Co.'s new San Diego warehouse at 2931 East Harbor Drive is shown in above architectural sketch. Unit provides for 1,600 sq. ft. of office space and an adjoining warehouse with an area of 14,000 sq. ft.



HAROLD A. KITTLESON, Los Angeles electronic engineering representative, changes business name to *Kittleson Co.*, and opens a branch office at 106-A South Cornell, Albuquerque, N. M. NEIL POWELL is manager for new branch. Firm is now representative in California, Arizona, Nevada and New Mexico for *Atomic Instrument Co.*, Cambridge, Mass., manufacturer of nuclear instruments.

HAROLD E. WILLIS, formerly sales manager of *Arizona Welding & Equipment Co.*, Phoenix, Ariz., joins *Machinists' Tool & Supply Co.*, Los Angeles, as Arizona resident salesman.



Thirty years service in *White Motor Co.* brings a big smile and congratulations to *R. W. Cochran* (left) from *Wilson D. Patterson* (right), Pacific Coast regional manager.

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Sprockets for Mill and Roller Chain



YUBA-Schrock sprockets are flame cut from steel plate. Patented cam-generated action produces sprocket teeth guaranteed to fit standard mill or roller chain with wearing qualities equal to sprockets made by other manufacturing methods. "Special" sprockets with "non-standard" number of teeth readily *cut to order* without penalty charges. Most emergency orders filled in 24 hours.

Phone, write or wire, nearest office NOW for quotations and deliveries.

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The Lufkin Line

By VIC FAWCETT

VACATION PLANS?



Vic Fawcett

The vacation travel suggestion I'm going to make is given with the full realization of possible loss of membership in the Los Angeles Chamber of Commerce—and the All-Year Club of Southern California. Yet, I feel I must unload.

California *is* wonderful, and rest assured that always any of our out-of-state friends will be welcomed with open arms. Lufkin's Los Angeles office will gladly be of assistance if it's the highlights you wish to see—studios, radio, or TV broadcasts, movie stars—or Lufkin's L. A. warehouse—BUT—

May I recommend for your consideration Western Canada, especially the Canadian Rockies, Banff, Lake Louise, Jasper National Park, Waterton Lakes. I am sure you will agree nothing compares with the grandeur and majesty of such mountain peaks as Cascade, Mt. Rundle, Sulphur Mt., Nordquay and many others.

I made this trip with my family summer before last and it is still quite fresh in my memory. Of course, there was an added thrill for me to revisit places like Calgary and Edmonton where I spent the first years of my life.

Calgary's "Stampede" and Wild West Round-up in mid-July is an annual sell-out and draws the finest riding and roping talent in North America.

In expanding Edmonton we spent several days with Charley Dyer, Lufkin's genial Canadian Division Manager. Next to the inspiring and majestic Rockies, I believe those hundreds of Lufkin Geared Pumping Units were among the highlights. Saw them at Redwater, Leduc, Woodbend, Stetler, Turner Valley—everywhere.

Here Lufkin is playing an important role in Canada's tremendous new oil industry. Use of our products by concerns like Amerada Petroleum, Imperial Oil, Texas Co., etc., is helping bring new wealth to this great frontier country.

Should all this enthusiasm result in your visiting the Maple Leaf country north of the border, and should you find yourself in Edmonton in need of travel assistance, the friendly and courteous bunch handling our Edmonton office will gladly lend a hand.

Best of luck to you, wherever your vacation trails may lead!

Vic Fawcett

PACIFIC COAST DIVISION
5959 S. Alameda St., Los Angeles 1, Calif.
AGENCY—ADAM HILL CO.
299 - 9th St., San Francisco, Calif.

Dallas **Lufkin, Texas** **New York**

Moore Dry Dock Co., Oakland, appoints three key men to higher posts in industrial machinery division. From left to right: *Dan W. Beatty*, in charge of engineering and estimating; *Charles J. Alciati*, manager of industrial machinery division; and *A. G. Hardy*, in charge of sales promotion and production department.



U. S. Steel Co. makes several appointments in two of its divisions. For *Columbia-Geneva Steel Div. of U. S. Steel Co.*, J. W. RIMMER is manager of newly created market development staff. LORING S. BROCK is appointed district vice president of division's Intermountain sales district. He succeeds ARTHUR C. MOORE, who is retiring. For *Consolidated Western Div. of U. S. Steel*, J. C. MCPHERSON becomes assistant vice president and manager of sales for San Francisco district, KENNETH LIEBER is named assistant vice president and manager of pipeline sales for all districts of div., J. G. THOMPSON is assistant vice president and manager of sales for Los Angeles district, and ALEX N. SILVERSTEIN is named assistant vice president of Consolidated Western Div.

Ward Products Corp., division of *Gabriel Corp.*, Cleveland, producer of TV and automotive antenna, appoints *G. S. Marshall Co.*, Pasadena, as jobber trade representative in Southern California. G. S. Marshall Co. is now representative in California, Arizona and New Mexico for *Eastern Air Devices*, Brooklyn, N. Y.

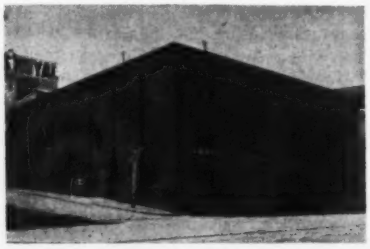
Six organizational changes are made in *Kaiser Steel Corp's* Los Angeles and Oakland area sales departments. In Los Angeles, J. L. JOUBERT is named district sales service manager, JACK MACKEY moves from credit office to sales staff, F. G. BREAR is added to sales staff, and GEORGE DE LA VERGNE becomes project engineer. R. W. BOWLES is appointed project engineer, and A. P. FARNSWORTH is sales service manager for Oakland sales office.

Mercury Hardware Co., 11203 Garvey Ave., El Monte, Calif., is named a distributor for TEXROPE drive equipment in San Gabriel Valley, Los Angeles County, by *Allis-Chalmers Manufacturing Co.*, Milwaukee, Wis.



Perry Kilsby Inc., 3311 East Slauson Ave., Los Angeles, is new sales representative for *Avon Tube Div., Higbie Manufacturing Co.*, Rochester, Mich.

A. Milne & Co., national distributors of hollow tool steels for metalworking and machining plants, die steels, and special high carbon steels for use in many industries, now have a new Pacific Coast (Washington, Oregon, California) headquarters office at 540 First St., San Francisco. R. D. CORTELYOU, Milne's Pacific Coast manager, resigned as of Feb. 1 from his former post as vice president and general manager of *Payne's Bolt Works Co.*, to enter business for himself through purchase of *Bay City Tying Wire Service* as well as to devote more time to the business of A. Milne & Co., whose products Cortelyou handled concurrently with his duties at Payne's Bolt Works Co.



New A. Milne & Co. headquarters

This move was designed to make use of more efficient warehousing facilities for Milne products, in the same building that houses operations of Bay City Tying Wire Service. That firm deals in wire box strapping, cement coated box nails, and other items used extensively in packaging and shipping of fruit, vegetables, and other food products.

Markel Products Co., Buffalo, N. Y. recorder manufacturer, is now represented in California, Arizona, Nevada and New Mexico, by Neely Enterprises, Hollywood. *A-V Tape Libraries, Inc.*, New York, maker of pre-recorded musical tapes, also appoints *Neely Enterprises* for representation in same area.

C. F. BRUNSON takes newly created position of sales consultant on plywood glues for *Monsanto Chemical Co.'s* Western division. Brunson headquarters in division's plywood glue sales offices, Seattle.

Ziegler Steel Service Co., Los Angeles, adds two new sales representatives. EMERY JOHNSTON is now in charge of Pomona Valley and a large portion of downtown Los Angeles industrial area. JOHN V. BUCKLEY is associated with Oakland division and covers San Francisco metropolitan area.

Space is sold as advertisers' inches All advertisements in this section are ⅛ inch short of contracted space to allow for borders and composition.

CLASSIFIED SECTION

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SPARE PARTS WAREHOUSING, PACKING & SHIPPING—

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I have averaged 28% reduction in personnel in the concerns I have reorganized. I have been retained a second and third time as two of the larger plants have expanded. . . .

Write or wire. Box 51, Western Industry, 609 Mission Street, San Francisco 5, Calif.

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Young graduate wanted for sales work in Northern California with well-known chemical manufacturing company expanding in the West.

Excellent opportunity for ambitious young man.

Write Box 52,
WESTERN INDUSTRY
609 Mission St., San Francisco 5, Calif.

100 GENUINE 8 x 10 PHOTOS 10c ea

24 HOUR SERVICE!

FREE DELIVERY ANYWHERE
MADE DIRECT FROM PHOTOS (OR NEGATIVES) • 50 8 x 10 13c ea. 500 8 x 10 8c ea.

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LARGEST PHOTO REPRODUCTION PLANT IN WEST

Republic Supply Company of California opens branch offices at 1331 T St., Sacrament, to serve Sacramento Valley and territory extending to Oregon and into Nevada. CHARLES H. MCINTYRE, resident area salesman for past three years, is in charge of offices. MATT EVERHARDY is new district agent for Mojave Desert and Owens Valley areas with headquarters at Ridgecrest, Calif. *L. S. Starrett Co.*, Athol, Mass., producer of precision industrial supplies, appoints Republic Supply Co. as its only statewide California distributor. *Rust-Oleum Corp.*, Evanston, Ill., manufacturer of rust-preventives, appoints Republic Supply Co. as a new distributing agency.



McIntyre *Evans*

R. D. EVANS joins sales force of *Materials Handling Equipment Co., Inc.*, Seattle, Towmotor Lift Truck distributor for northwest territory and Alaska. Other sales department additions are WALTER F. MCCLELLAND and NELS LAGERSTEDT. Main plant and office are located at 1437 Elliott Ave. West, Seattle, with branches in Portland and Spokane.

NELSON A. HOWARD, JR., General Petroleum Bldg., 612 So. Flower St., Los Angeles, is appointed exclusive West Coast and Rocky Mountain representative for *Alox Corp.*, Niagara Falls, New York, manufacturers of rust inhibitors.

Inductance Motors Corp., Woodside, Long Island, N. Y., maker of a small type of induction and synchronous-type motors for industrial uses, appoints *Conrad R. Strassner Co.*, Los Angeles, for representation in Northern California, Arizona, Nevada and New Mexico.

Simple Solution to Problem of Installing Oxygen Tubing

H. M. HALDANE and C. N. Wust, two of Lockheed's trouble-shooting manufacturing engineers whose orders are "to protect work in progress," have solved a critical problem of installing pre-shaped, easily bendable tubing in inaccessible spaces of F-94 fighters.

High pressure oxygen systems, capable of withstanding 1,700 lbs. pressure per square inch, require use of soft copper tubing. Some pieces are eight feet in length. They are machine-bent, twisted and spiraled to carry oxygen under, over and around various obstructions in the plane.

This soft copper tubing, only 3/16-inch diameter, bends under its own weight if picked up. Undue flexing invites failure under internal pressure. Haldane and Wust solved the problem of how to snake the tubes into position through the plane and fit them snugly into place without flexing.

Their solution: When the copper tubing is shaped, a steel tube is prekinked into an identical shape; then the two are taped together. Once the copper tubing is installed, the tape is cut and the steel support removed, ready to be used again.

Depreciation Part of Production Cost

TO PROVIDE the increased dollars to maintain or replace the present tools of production, depreciation on current values should be recognized as a proper cost of production, according to President A. B. Hossack of The American Appraisal Company, speaking before the Los Angeles chapter of the National Association of Cost Accountants.

Furthermore, he recommended that the excess of the depreciation on such basis over original cost be set up for replacement of plant facilities. If computed on a systematic basis, the procedure will recognize depreciation sustained on the present portion of the present plant used up in service, he said, and the funds provided in costs will either go into added facilities, other needs of the business, or else be available and reflected by cash.

"You can probably all agree," he added, "that the basic reason for depreciation and depletion is due to the recognition that time and use does in fact use up plant facilities. Accordingly, we should not quarrel with the statement that some part of your plant is in fact sold with every product that moves out from the shipping platform."

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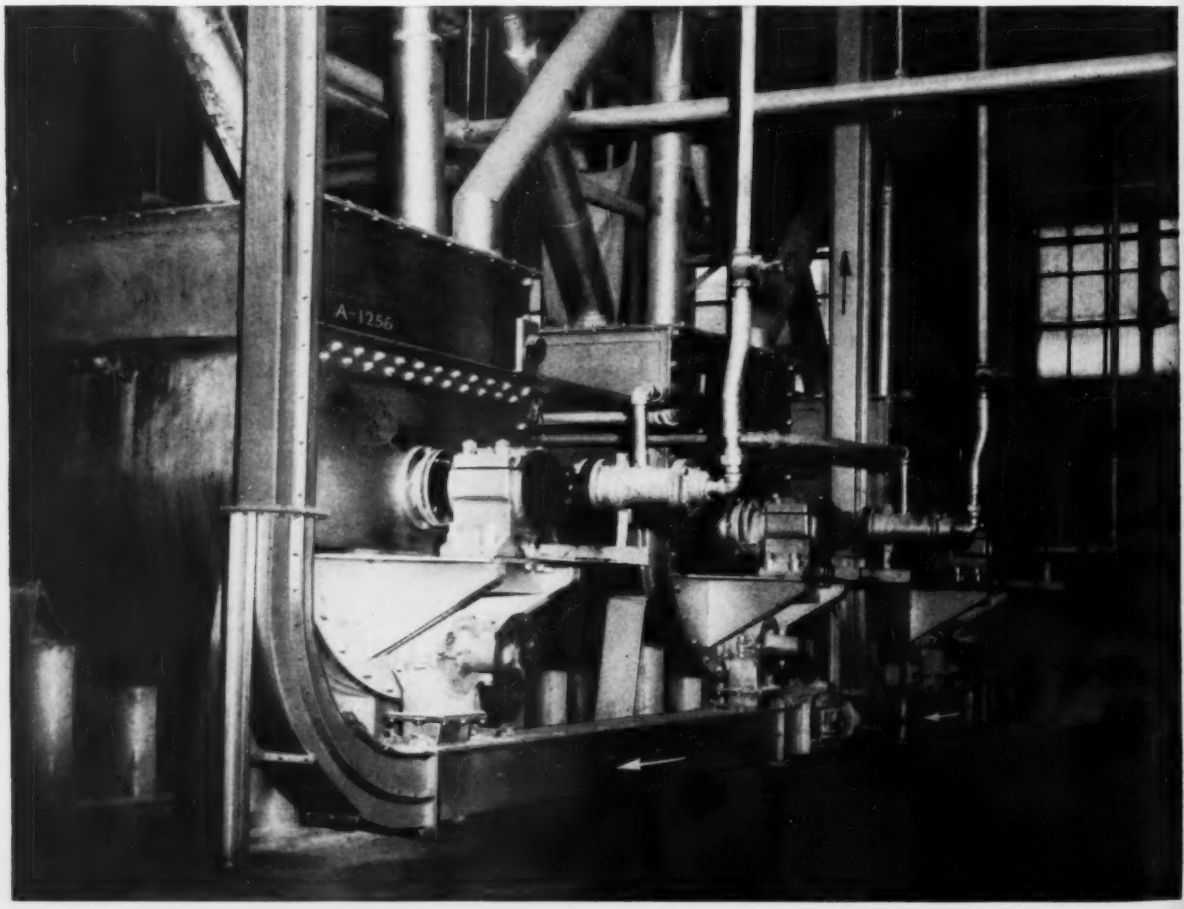
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